

March 15, 1955

The IRON AGE

The National Metalworking Weekly



How to Build a Management Team P.43

Skilled Workers Threaten Break With UAW P.47

Can Tin-Zinc Plating Improve Your Product? P.92

Digest of the Week P - 2

THE OTHER TURN



That spring cleaning urge

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.



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It's a pleasure to work with a fine hand tool

Today more and more newcomers to the do-it-yourself ranks are coming to realize what professional craftsmen have always known—that there's nothing so satisfying in use as a quality hand tool.

A favorite tool of professionals and amateurs alike is this No. 923 10-in. bit brace, a product of Stanley Tools, of New Britain, Conn. The bow, the ball-bearing head, the box ratchet, the heavy-duty shell and the self-centering chuck are all made of cold-drawn carbon-steel bars.

While we do not produce cold-drawn carbon bars, Bethlehem supplies hot-rolled bars to independent cold-drawers who serve Stanley Tools. Cold-drawing gives hot-rolled steel a brighter finish, closer dimensional accuracy, improved machinability and greater strength. Result: a handsome, rugged, smooth-working hand tool.

If you are looking for bars that will give you an extra-strong and durable, extra-good-looking product, we recommend your independent supplier of cold-drawn bars. He'll serve you well!

* * * * *

If you find the supply of carbon bars a bit tight just now, we ask your forbearance. We're doing our best to meet the unprecedented demand, all the while maintaining our customary quality standards.

* * * * *

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BETHLEHEM STEEL



March 15, 1956—Vol. 177, No. 11

The IRON AGE

Digest of the Week in Metalworking

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Chestnut and 56th Sts. Philadelphia 39, Pa.

NEWS DEVELOPMENTS

IS SUB BREEDING UNREST
IN LABOR?

P. 47

Skilled worker insurrection against auto union may be symptomatic of dissatisfaction with workings of supplemental unemployment plans. Workers least subject to layoffs take dim view of SUB as a labor gain.

DON'T LOOK FOR FAST
FREIGHT CAR RELIEF

P. 48

The freight car building program is a whopper. But don't let that fool you. It will take over two years to complete. And meanwhile car scrapings are running high. Steel shortage is part of the problem.

EXPORT SALES NEED
MANAGEMENT BACKING

P. 50

Export sales headaches may begin with top management itself, not the export sales chief. Today's world trade problems are long-range, need careful analysis by your firm's top-level planners.

PRIVATE ATOMIC INDUSTRY
NEEDS HELP

P. 52

Unless private developers of nuclear power get help, government ownership of all nuclear facilities may result. Insuring potentially destructive reactors is big headache. But this may be solved by laws requiring government to insure facilities.

MASS MISSILE OUTPUT
SLATED FOR EARLY '57

P. 65

Mass production of the deadly intercontinental missile will probably get started early next year. Gov't plans call for building of more prototypes, launching facilities, improved instrumentation.

THE IRON AGE



BUSINESS IS RE-EVALUATING its first-line supervisory group. Trend is to grant more responsibility to middle management area in building up a solid operating team—See P. 43.

NEXT 10 YEARS WILL TELL IN AUTOMATION

P. 71

Watch the race between USSR and U. S. in automation. Coming decade will be most important. Russian industry is scheduled for king-size dose, like it or not. U. S. businessmen will be the object of a streamlined campaign promoting automation systems. A first hand report.

FEATURE ARTICLES

CUT BLANKING COSTS WITH SIMPLIFIED DESIGN P. 83

Simple blank design provides a direct answer to how blanking costs can be effectively cut. Simplicity lowers tool costs, increases production and extends tool life. These down-to-earth hints for basic metal blank design point out the shortcuts to economy, based on shop experience.

GET BETTER GRINDS WITH NEW CONTROL UNIT P. 87

A new electronic control unit can be fitted on your present automatic grinder in a matter of a few hours. Built for precision, yet ruggedly dependable, its circuitry is designed to insure a maximum of repeat accuracy. Conversion of a Landis crankpin grinder to the use of this new device took less than seven hours. Accuracy is maintained to approximately 0.0001 in., even at relatively fast speed.

UNIFORM OUTPUT KEYED TO BETTER HANDLING P. 90

Talk about automation makes it easy to forget there's many a case where manual transfer and positioning can do the job better. Even in high volume production of such small parts as diecast strikers for car doors, manual operations can be widely used, and supplemented with automated machining, plating.

CAN TIN-ZINC PLATING IMPROVE YOUR PRODUCTS P. 92

Plating with dual tin-zinc alloy can be handled without difficulty using standard equipment. Advantages are many, include excellent solderability, good corrosion and abrasion resistance, ductility and appearance. Production plating of tin-zinc alloys shows anticipated problems to be nonexistent. The binary alloy plates directly on most common basis metals. Throwing, covering power are good.

HIGH-SPEED WELDER TESTS OWN JOINTS P. 96

A soon-to-be-installed welder will test its own joints to a 4000 lb pull at 800 welds per hour. Flanged rods are automatically weld-fabricated from stamped washers and thick coil stock. Air-operated test equipment finds faults by severe overstressing.

MARKETS AND PRICES

WHY 1955 WAS A RECORD YEAR FOR STEEL P. 45

Automotive industry used nearly 25 pct of steel shipments during 1955. Construction-Maintenance was second with 18.4 pct. Consumption figures reflect economic prosperity as shipments set new record.

NEXT WEEK:

HAVE GAMBLERS GOT YOUR PLANT'S NUMBER?

Controversial subject of in-plant gambling gets a perceptive viewing next week. How widespread is gambling in industry? Is it really detrimental to production to the point of injuring a company? Can it be stopped? IRON AGE has talked to company officials and police for answers.

FORMER ECONOMIC BEARS ARE NOW BULLS P. 57

Most signs of weakness in business picture never materialized. Where slack did occur, other segments of industry stepped in to take it up. Now danger is of possible inflation in competition for metals and money and from higher labor costs.

COAST BUILDING BOOM MEANS NEW MARKETS P. 69

West Coast industry plans mean new markets for metalworking products, services. Upcoming building projects will blanket coastal area, extend far inland. 1956 will be a record construction year.

HECTIC TIMES AHEAD IN STEEL MARKET P. 139

Look for an unusually strong steel market in second quarter. The scramble will be intensified by the outlook for higher prices and the possibility of trouble with steel labor. Everybody's pitching.

BRITISH SWAP COPPER WIRE FOR USSR STEEL P. 144

While U. S. fabricators are straining to get enough copper, British fabricators are able to buy enough to sell large quantity to USSR. Because the British need Russian steel, the situation will continue.

HOW TO SELECT MACHINE TOOL LUBRICANTS

Better than 90 pct of your lubrication requirements can often be handled by four or five grades of oil and by two greases. If you use more, chances are its costing you too much. With machine tool builders cooperation, dozens of oils and greases in your stockroom may be cut to a few.

Loss of magnetite reduced from **2.2 pounds**
per ton of coal processed to less than **½ pound**

8 JEFFREY MAGNETIC SEPARATORS serve this

Jones & Laughlin coal preparation plant



Magnetite, scraped from the magnetic separator drum, is fed back into the system to maintain 1.55 specific gravity.

Wash water passes under these eight Jeffrey magnetic separators to recover the magnetite removed from slate and coal leaving heavy-media separator drums.

Coal floats and slate sinks in water that has been given a specific gravity of 1.55 by the addition of magnetite. This is the principle of heavy-media separation, by which coal is cleaned and graded, and other minerals classified, rapidly and efficiently.

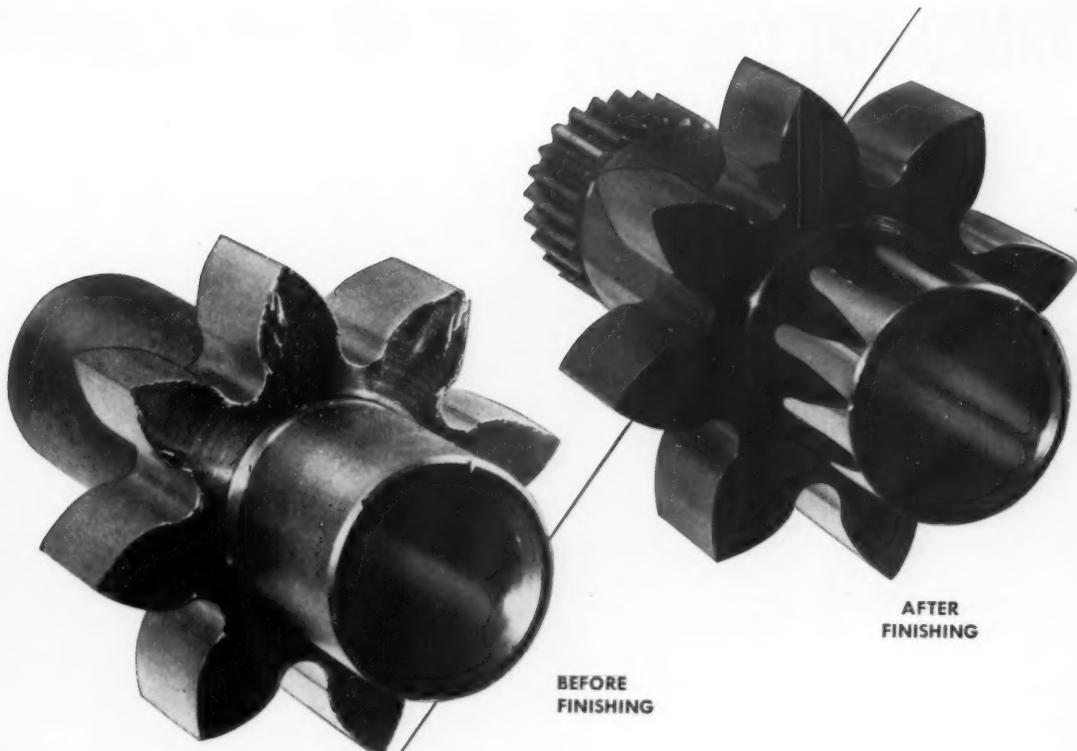
This Jones & Laughlin coal preparation plant was losing 2.2 pounds of magnetite for every ton of material processed, which was serious. 2400 tons per hour are processed here. They revamped the system to include Jeffrey magnetic separators and now they lose less than a half-pound per ton.

After cleaning, the coal again passes through a second heavy-media operation, wherein the heavier steam coal is separated from the lighter metallurgical coal. Here, again, Jeffrey magnetic separators have a part in recovering the magnetite.

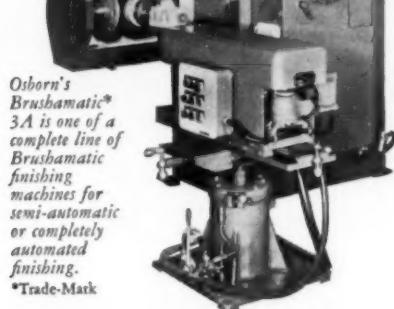
Jeffrey engineers will help you apply magnetic separators to solve wet concentration and magnetic recovery problems. Bulletin 846 describes this equipment. The Jeffrey Manufacturing Company, Columbus 16, Ohio.



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CHICAGO MARCH 19-23, 1956

MORE precise finishing of parts is vital to the continuing improvements in jet aircraft components. Fuel pump gears, shown above, are an example.

Unlike the original oily, kerosene-type fuels, today's jet fuel has extremely low lubricating quality. Brushing to remove burrs—blend surfaces and edges of teeth—is an important early step in producing the micro-finish that permits fuel pump gears to run at speeds to 3500 rpm, under pressures to 900 psi . . . without lubrication. Higher finishes are also reducing torque, greatly increasing equipment service life.

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You can easily meet your plant piping requirements with Armco Welded Steel Pipe. Standard and special fittings can be fabricated and attached to straight lengths of pipe to give you a perfect fit and easy installation. Field cutting and fabrication is no problem with easily welded Armco Pipe.



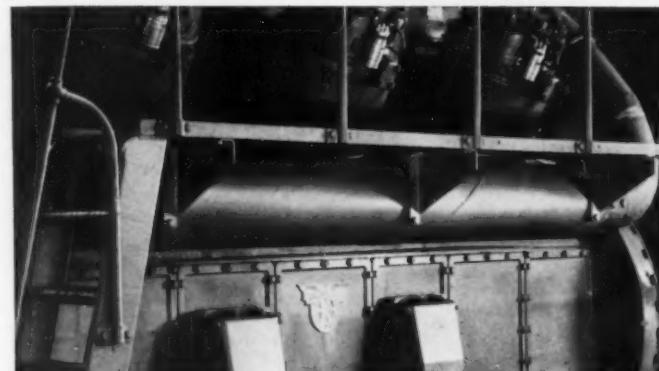
Supply Lines

Water supply lines, gas lines and similar installations go fast with long, 50-foot lengths of Armco Pipe. There are fewer sections to handle, fewer joints to make, fewer chances for leaks. For water supply lines, coatings are supplied to AWWA specifications with a spun enamel lining to prevent tuberculation.



Fabricated Products

Where product design requires a cylinder of uniform strength and roundness, many manufacturers have found it profitable to use Armco Pipe. Here Armco Pipe (beneath the service platform) serves as the air inlet manifold on a heavy-duty compressor unit.



Wide Size Range

You can take advantage of the wide size range of Armco Pipe to meet your specific needs. Diameters range from 6 to 36 inches, wall thicknesses from $\frac{3}{16}$ - to $\frac{1}{2}$ -inch.

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age & Metal Products, Inc., Welded Pipe Sales Division, 4336 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Armco Welded Steel Pipe





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Indexed in the Industrial Arts Index
and the Engineering Index.

EDITORIAL

Do We Need Credit Controls?

♦ MANY PEOPLE are worried about the amount of money everyone owes everyone else. There is a hubbub over the need for controls. Federal Reserve Board officials are concerned privately about how much we have gone into hock for.

Credit—through installment purchases—is a mass buying pattern that supports mass production. You may not understand or like it, but big credit is here to stay. Faith in job stability has caused the average person to gamble regularly on his future ability to pay.

This collective chance-taking by people all over the nation has made it possible to increase sales now, to build more factories, and to support a huge defense budget.

To unduly tamper with the credit of the country is dangerous. There are people advocating strict credit control who know only the classical and statistical data. That's not enough. There is far more to it than that; the human angle for instance.

It is true that if people with many debts should lose their jobs, it would be bad for them—and for business. It was that way yesterday. It will be that way tomorrow. That argument is no more valid today than it was long ago.

It is also true that if people go too far into debt they will be "out of the market" for new products and services. But there is nothing new in this either. It is an argument that has been brought up from time to time over the past 20 years.

The hard truth is: If people were to practice literally Poor Richard's preachings, a lot of factories would shut down—permanently. People generally realize when they "have had it"; better and sooner than government "controllers" would know.

Buying too much on the cuff has a practical way of driving home the danger of extended credit. Already millions have decided to pay back faster and take on new debt at a slower pace.

The innate feeling of those who have had plenty of experience with installment buying is a better checkrein on excesses than fallible government control.

Besides, who says the government knows when and how to control something it doesn't know much about?

Tom Campbell

EDITOR-IN-CHIEF



CUTS COSTS in Your Plant

Ideal for production, maintenance, repair, and automatic welding, Hobart Electric Drive Welders give you top performance at low cost. Liberal use of copper, two-way ventilation, greater arc stability, and safer, more efficient operating temperatures make Hobart today's best value. There is a Hobart specifically designed to do your work and cut your costs.



Bantam Champ



Rectifiers



Powromatic

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Hobart's 1,000 combinations of welding heat, teamed with auxiliary power on "go anywhere" portable mountings mean you can handle all jobs at less expense. Convenience features that are standard equipment give you dollar savings when you purchase a Hobart, and continue to save you money throughout the welder's lifetime.



Engine Drive



"Husky Boy"



Water Cooled AC-AC



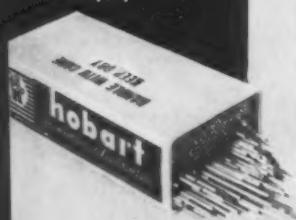
Air Cooled AC-AC



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dear editor:

letters from readers

Steel Extras

Sir:

On pages 47 and 48 in the February 9th issue of THE IRON AGE there is an article titled "How New Extras Affect Your Steel Bill." We would like your permission to have mimeographed copies of this article made in our office for distribution to the various personnel in our company. C. S. Duvall, *The Maryland Bolt and Nut Co., Baltimore 9, Md.*

Of course, you have our permission.—Ed.

Joint Corrosion

Sir:

If possible, please send to the address below six tear sheets of the article entitled "Fluxless Aluminum Joining Avoids Joint Corrosion" found on page 71 of the March 1 issue of THE IRON AGE. Future use indicates that Al and Cu bus bars may have to be joined.

Also, congratulations on your common sense editorials. P. Methé, *Research Supervisor, Allegheny Ludlum Steel Corp., Pittsburgh, Pa.*

Reclassified

Sir:

We noticed with interest the article entitled "How to Get Better Welds in a Weldable Steel" which appeared in your January 19 issue. We are in general, of course, pleased with this publicity . . . However, in the interest of accuracy we would like to point out that the steel was improperly identified.

Throughout the article, you referred to "T-1" Steel as "Carilloy," "Carilloy Steel" and "Carilloy T-1 Steel." As you perhaps know, "Carilloy" is our general trade name for a large group of USS Alloy Steels of widely varying analyses. It is true that when "T-1" Steel was first introduced we did for a time classify it as one of our Carilloy Steels, and called it USS Carilloy

"T-1" Steel. We soon realized, however, that it was quite different from our other Carilloy Steels in many important aspects, and thus should not be classified as one of that group. For more than a year, therefore, we have not used the term Carilloy in connection with "T-1" Steel in any manner. This product is now properly identified as USS "T-1" Constructional Alloy Steel, or simply as "T-1" Steel. R. J. Wilcox, *Assistant Director of Advertising, United States Steel Corp., Pittsburgh, Pa.*

Steel For Schools

Sir:

Under heading "Schools Need More Steel," Newsfront, page 29, IRON AGE, March 1, 1956, the writer's office having designed many steel frame schools would like to suggest large tonnages of steel can be saved if this type of school is designed as a continuous moment welded-steel frame structure.

It is not unusual to show a five to ten pct saving by using this method for design as compared to design methods used when fastening is done by riveting or bolting.

Studies made in our office indicate that if welding as a design and fastening method would be used on all structural steel frames, it would be possible to pick up a net saving in structural steel of between 200,000 and 250,000 tons of structural steel, which could be used to permit the construction of more buildings from the same mill rolling capacity of approximately 3,000,000 tons now used for structural purposes.

One other thought is that the cost of erected steel would be less for each individual building. V. R. P. Saxe, *1701 St. Paul St., Baltimore, Md.*



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Not one strip rolling requirement in ten need be carefully "miked" to assure close width tolerance.

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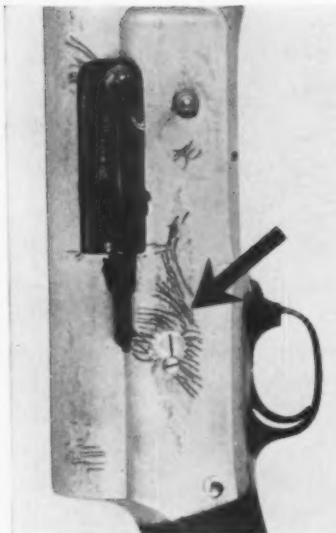
Modern rolling, annealing and precision control equipment assure uniform high quality under the most rigid specifications.

And Somers 40 years experience in a wide range of applications is available to help solve your strip problem without obligation.

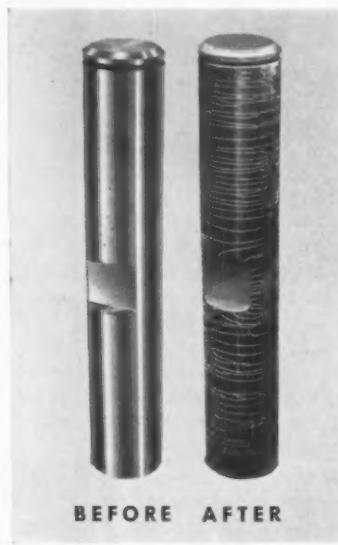
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WATERBURY, CONN.



Stresscoat is a Magnaflux developed brittle lacquer coating for testing and measuring stresses in working parts and designs. Stress analysis is providing new ways to reduce the cost and weight of products to make them stronger, better and cheaper.



Inspection with fluorescent Magnaglo under black light reveals cracks as glowing danger signals impossible to overlook. Magnaglo increases the speed of inspection and makes it easy to spot and identify defects in keyways, threads and other hard to see places.



Write for complete details concerning any of the above case studies, (excerpts from MAGNAFACTS), or ask for our new booklet on Lower Manufacturing Costs.

Case Studies: TESTING METHODS



"GOOD TURN" INSURANCE pays off for the Todd Shipyards Corp., Brooklyn, N.Y. A portable Magnaflux unit is used to inspect for cracks in keyed taper of an 18" propeller shaft of one of the giant ocean-going vessels.

Extra Savings in Both Manufacturing and Preventive Maintenance Inspection

M methods pay "extra" dividends when used to inspect the products you make. These testing methods help pinpoint early defects in forgings, weldments, castings, bar steel and other component parts in the "rough" or finished state. It enables you to take corrective steps to eliminate their cause in the production process. You save the time, money and materials usually lost by processing defective parts and excessive scrap. By clearly showing the extent and seriousness of defects, M methods provide added benefits from salvage operations.

A "safety" bonus can mean more than dollar savings in a preventive maintenance inspection program. Early detection of fatigue cracks in a crane hook can prevent an accident which could cost lives as well as money. Magnaflux offers many complete, easy, quick, portable methods for "in plant" or "in the field" inspection of machinery and equipment.

Consider for a moment, the many ways M test methods can help you save "extra" in your present operations. Consult your Magnaflux engineer for specific information and examples of how M can help you produce better for less!



"Conveyerized" Magnaflux inspection is engineered for jet engine production line. Jet engine vanes are inspected at the rate of 5,000 or more a day. First step is magnetizing vanes. Conveyor moves vanes into inspection booth (above) where inspector watches for any accumulation of magnetic particles indicating longitudinal defects. After passing through a second ferro-magnetic bath and longitudinal magnetic field, vanes are inspected for transverse defects. Then they move automatically through a de-magnetizer.

Take Your Inspection Problems to the House of Answers . . .

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fatigue cracks

by William M. Coffey

Dates to Remember

As is our usual custom we once again bring you up to date on the big days coming up. April is really loaded.

April 1-7—*Honey for Breakfast Week*

April 30—*America's Heartland Development Month*

April 1-30—*Cereal and Milk Spring Festival*

April 8—*National Mother-in-Law Day*

April 8-16—*American Comedy Week*

April 9-12—*Packaging Week*

April 13—*National Fun Day (What's everybody going to do?)*

April 15-21—*Classified Brand Names Week*

April 22-28—*International Potato Bread for Flavor Week*

April 22-28—*National Secretaries Week*

May 1-7—*National Correct Posture Week*

May 1-31—*Better Bedding Time*

May 1-31—*Fig Festival*

May 1-31—*National Canned Hamburger Month*

May 1-31—*National Rug Cleaning Month*

May 1-31—*National Tavern Month*

May 1-31—*National Water Systems Month*

May 6—*Rural Life Sunday*

May 7—*National Tax Freedom Holiday (Ed. note — Has government heard about this one?)*

May 7-13—*National Raisin Week*

May 20-26—*National Domestic Rabbit Week*

... and to top it all off keep in mind that the whole month of April is Clean Oil Month. Don't you be the one caught with dirty oil!

Puzzlers

We cackalate that the highest point at which the ladder will touch the wall is 11.28 ft (Feb. 23 bonus

puzzler). C. W. McKinley, The Iron Age Puzzle Club at General Steel Castings, Bob Castle, Hoover Co., G. M. Hebron and Myron Bowerman of the Alliance Machine Co. all cackalate the same way.

New Puzzler

A man and wife, celebrating their twentieth wedding anniversary, have a son and twin daughters. The age of the wife equals the combined ages of the children. When the couple first met, three years before their marriage, the man's age was half again as much as the woman's. In as many years from now as each twin is now old, the combined ages of the parents will be half again as much as the combined ages of the children then.

Double the husband's present age plus the present age of the son is equal to double the wife's age plus three times the age of one twin. When the couple's silver anniversary arrives the son's age will be half the age that his mother's will be then and equal to the combined present ages of the twins. If the family survives to the date of the golden anniversary, the son will be as old as his father is now and the combined ages of the children will be half again as much as the combined ages of the parents.

What are the present ages of each member of the family?

* * *

An elderly farmer was awakened in the wee hours by a pounding on the door and was confronted by a young man standing in the entry.

"What can I do for you at such a late hour, young man?" was the inquiry.

"I'd like to borrow your lantern so I can go courting," replied the caller.

"Why, when I was young and courting my wife," said the farmer, "I didn't take along a lantern."

"I know," shot back the young man, "and look what you got."

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* * *

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Couplings; and industrial V-belts.

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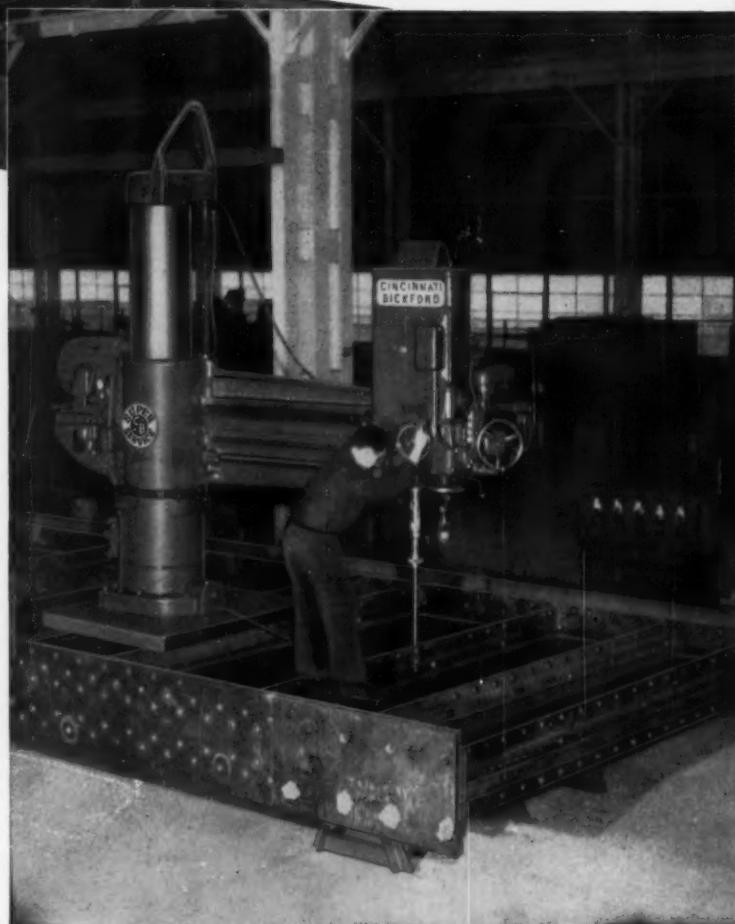
Instead of positioning this 57,100 pound girder for drilling operations, the machine is moved by crane to the job.

This 6-foot arm, 17-inch diameter column Cincinnati Bickford Super Service Radial Drill is equipped with a lifting bail for portable use on large structural members and base plates where it is much faster to move the machine than the work. The machine is never clamped to the piece or floor for these portable drilling operations since it is properly balanced and of ample weight to neither tip nor rise up while drilling. Various sizes of holes are drilled in the part shown. Savings of 50 to 75 per cent over the previous method which used two men and a portable air drill, have been effected.

CINCINNATI BICKFORD

saves 50% to 75%

AT
LINK-BELT
COMPANY



Photos made at the new Link-Belt Company plant in Colmar, Pa.



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GIDDINGS & LEWIS MACHINE TOOL CO. • Fond Du Lac, Wisconsin

dates to remember

MARCH

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS — Spring meeting, March 18-21, Multnomah Hotel, Portland, Ore. Society headquarters, 29 W. 39th St., New York City.

STEEL FOUNDERS' SOCIETY OF AMERICA — Annual meeting, March 19-20, Drake Hotel, Chicago. Society headquarters, 606 Terminal Tower, Cleveland.

FARM EQUIPMENT INSTITUTE—13th industry-research conference, March 28-29, Cornell University, Ithaca, N. Y. Society headquarters, 608 S. Dearborn St., Chicago.

EXPOSITIONS

ASTE—Industrial exposition, March 19-23, Chicago.

MATERIALS HANDLING SHOW, June 5-8, Cleveland.

ASSN. OF IRON & STEEL ENGINEERS, Sept. 25-28, Cleveland.

METAL SHOW—Oct. 8-12, Cleveland.

APRIL

MATERIALS HANDLING INSTITUTE—Spring meeting, April 3, Edgewater Beach Hotel, Chicago. Society headquarters, 813 Clark Bldg., Pittsburgh.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.—Annual spring engineering conference, April 4-6, Lehigh University, Bethlehem, Pa. Society headquarters, 101 Park Ave., New York.

AMERICAN SOCIETY OF LUBRICATION ENGINEERS—Annual meeting and lubrication exhibit, April 4-6, William Penn Hotel, Pittsburgh. Society headquarters, 84 E. Randolph St., Chicago.

NATIONAL SCREW MACHINE PRODUCTS ASSN.—Annual business meeting, April 4-7, Hotel Schroeder, Milwaukee. Society headquarters, 1010 Euclid Bldg., Cleveland.

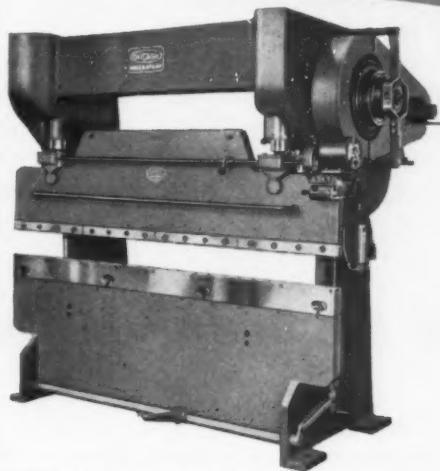
AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS—Annual conference, April 9-11, Netherland Plaza Hotel, Cincinnati, O. Society headquarters, 29 W. 39th St., New York.

METAL POWDER ASSN.—12th annual meeting, April 10-12, Cleveland Hotel, Cleveland. Society headquarters, 420 Lexington Ave., New York.

NATIONAL ASSN. OF ARCHITECTURAL METAL MANUFACTURERS—Annual convention, April 12-17, Belview-Biltmore Hotel, Belleair, Fla. Society headquarters, 7209 Cedar Ave., Washington, D. C.

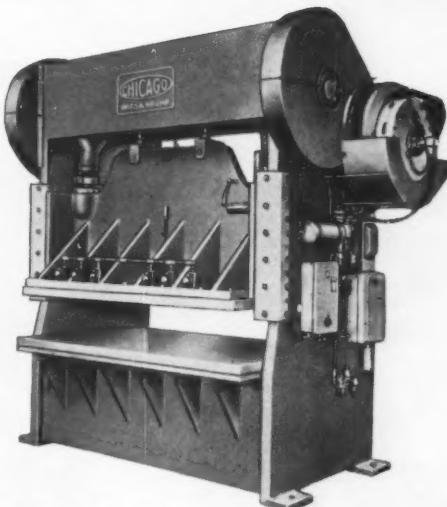
ENVIRONMENT EQUIPMENT INSTITUTE—Annual meeting, April 19-20, Sheraton Hotel, Chicago. Society headquarters, 6420 W. Howard St., Chicago.

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UNITED AIR LINES ANNOUNCES

A New Standard of Air Freight Service! In the latter part of April the first of five new DC-6A Cargoliners® will join the United Air Lines fleet. Added to the ten all-cargo planes we have now, these new DC-6As will increase our all-cargo space by nearly 70%.

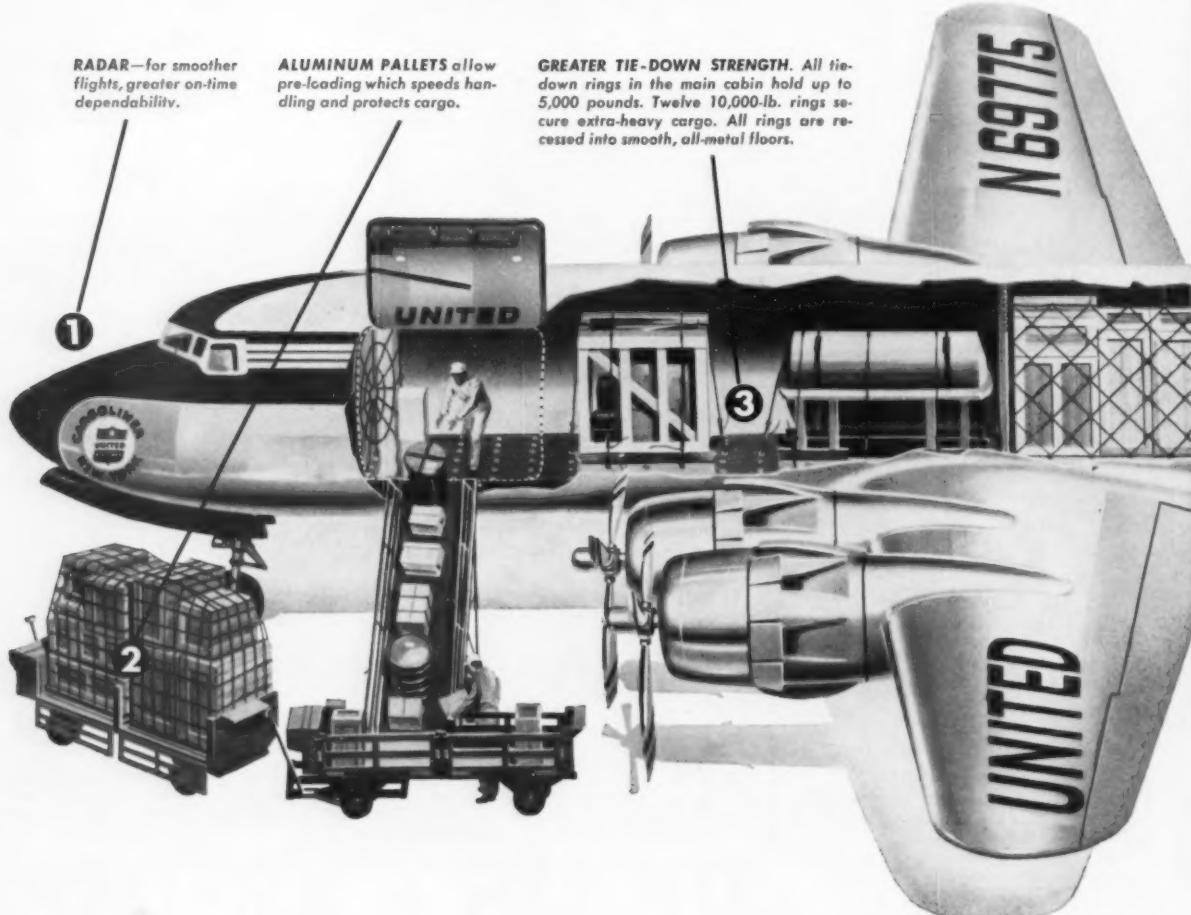
United's DC-6A Cargoliner is not only a new plane, it is a *different* plane. It incorporates many advanced and exclusive features. It carries up to 30,000 pounds of cargo, at a speed of 300 m.p.h. It ac-

commades single pieces up to 76" x 81" x 115", and up to 8000 pounds.

In addition to this big and growing all-cargo fleet, you are also served by our regular Mainliners,® including United's DC-7s—which provide the nation's greatest 365 m.p.h. cargo lift. And from United Air Lines you get these exclusive "extras"—

Telemeter Air Bill. Special new equipment and United's vast communications system makes possible the handling of

Many exclusive features for greater



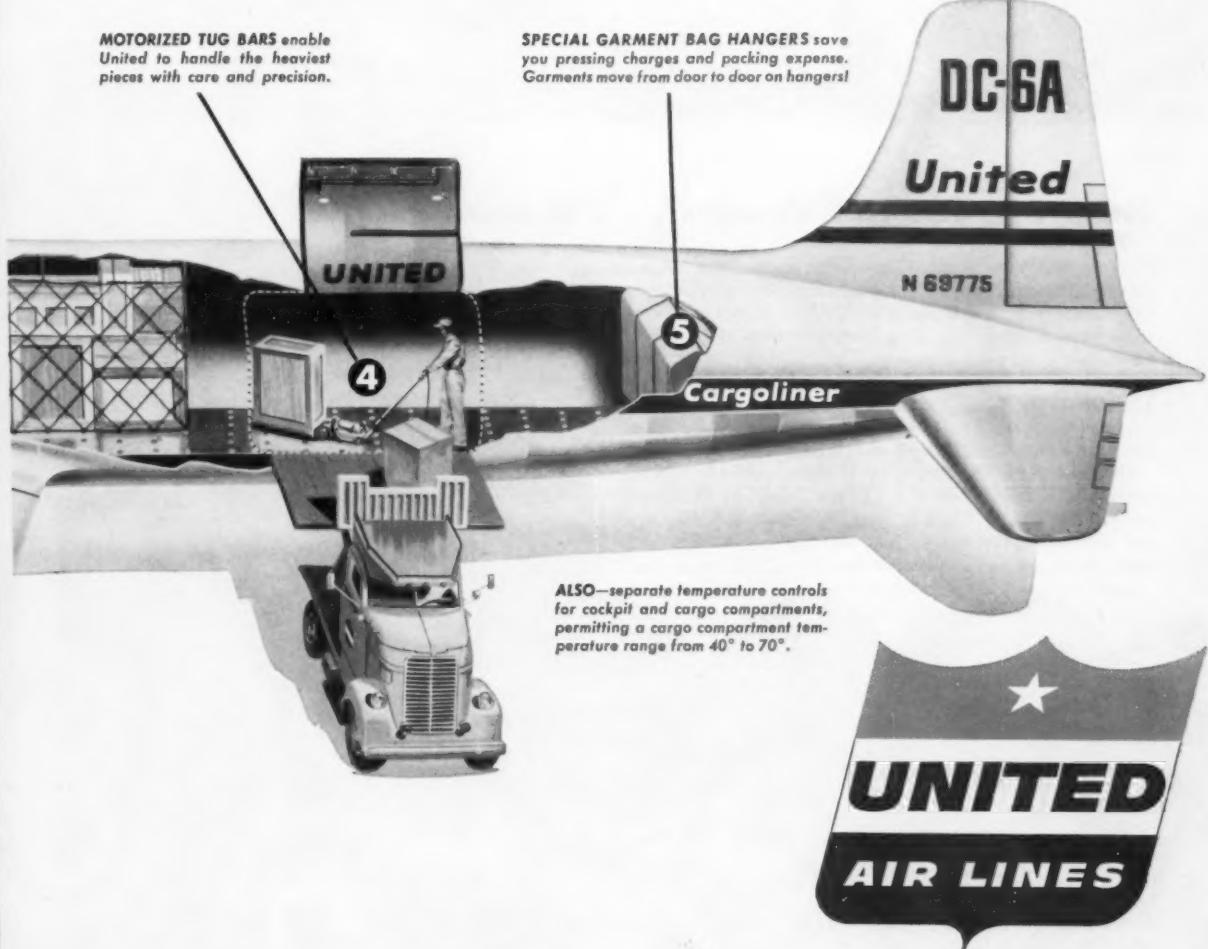
NEW DC-6A CARGOLINERS

complete air bills by wire. Advance notice of expected arrivals is possible now — while shipments are still in the air. This means the consignee can have pickup arrangements completed when the plane arrives.

Reserved Air Freight Space on All Equipment. An important United Air Lines exclusive. On request you can get advance reserved space on any United plane to any of the 80 cities on our route, and on connecting world-wide carriers.

These exclusives may seem like special handling to you—but they're just part of United's regular routine. Such service features plus the new DC-6As add up to just one thing: *A completely new standard of air freight service for you.* For service or information call your United Air Lines Freight Representative or write for new booklet on air freight tailored to your needs! Cargo Sales Division, Dept. IA-3, United Air Lines, 5959 South Cicero Avenue, Chicago 38, Illinois.

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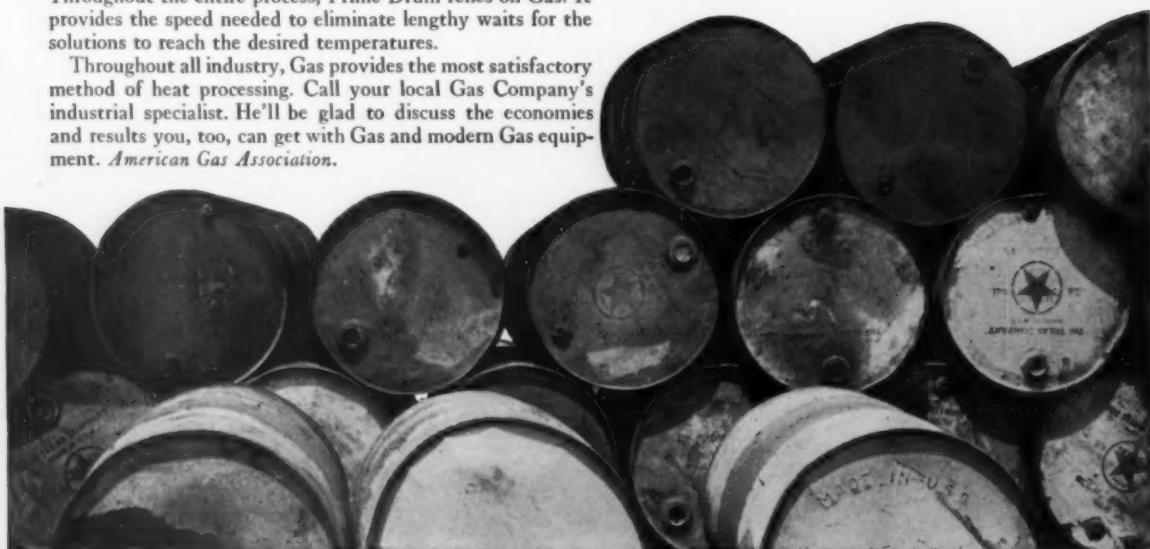


New life for old drums . . . thanks to *GAS*

Here at the Prime Drum Corporation in Norfolk, Virginia, old steel drums are refurbished in a series of Gas heat processes. The drums are stripped of rust and foreign matter in a caustic soda solution heated by Gas. They are then neutralized in water, and dried prior to painting.

Gas heats the water, dries the drums, bakes the paint. Throughout the entire process, Prime Drum relies on Gas. It provides the speed needed to eliminate lengthy waits for the solutions to reach the desired temperatures.

Throughout all industry, Gas provides the most satisfactory method of heat processing. Call your local Gas Company's industrial specialist. He'll be glad to discuss the economies and results you, too, can get with Gas and modern Gas equipment. *American Gas Association.*



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ROEBLING makes high carbon steel spring wire and flat spring steel...and makes it *better*...for every sort of spring and for every product that requires spring characteristics. Hard drawn, hard rolled, annealed or soft, tempered or untempered...they're all available to meet your requirements exactly.

Among these Roebling materials are zig-zag and no-sag wires; mechanical and valve spring wires; music wire; clock and motor type spring wires; flat spring steel and upholstery spring wire of all types. The variety of parts into which these are formed is almost endless, but manufacturers all report that Roebling quality and uniformity reduce machine downtime.

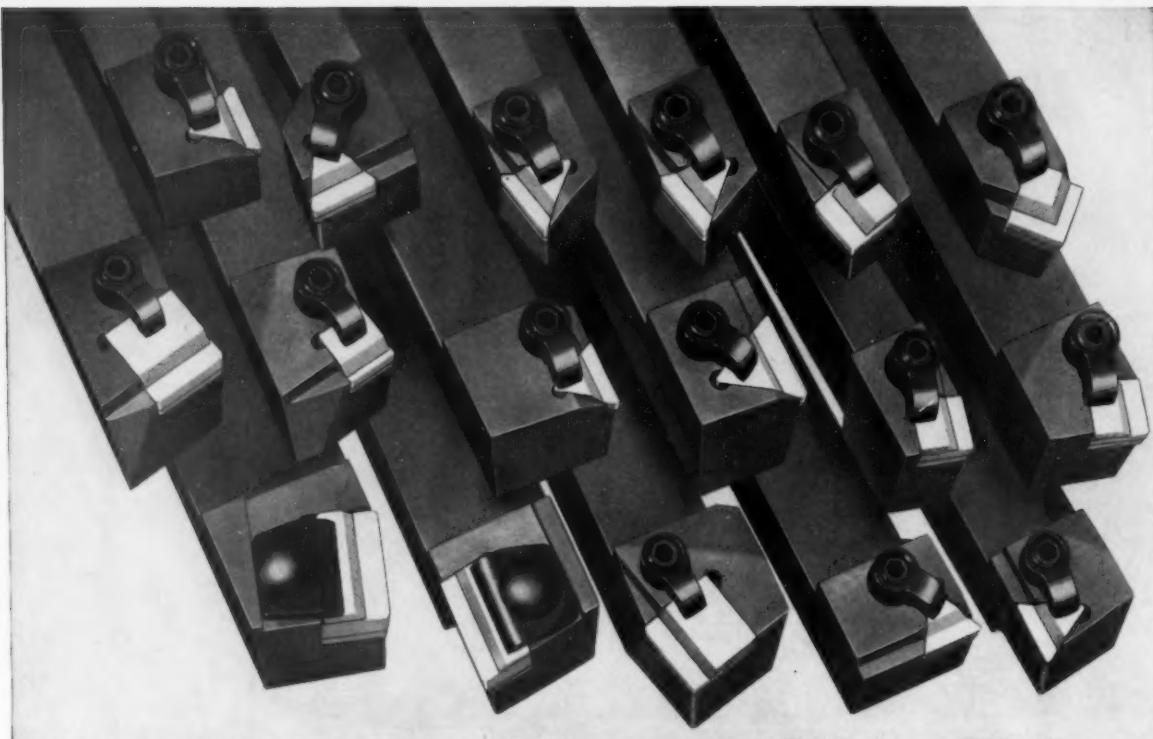
Learn for yourself how Roebling can help your production and product. John A. Roebling's Sons Corp., Trenton 2, N. J.



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KENNAMETAL* today offers the tooling for tomorrow

Kendex Button and Heavy Duty tools can truly be considered as the "Tooling for Tomorrow."

Kendex holders are simple and rugged in construction; fitted with trouble-free, interchangeable "hardware"; accommodate square, round and triangular turnover, throw-away button inserts that eliminate costly grinding . . . all features needed to keep tomorrow's high speed, highly synchronized production lines on the go—hour after hour.

"Tooling for Tomorrow" must face up to varied cutting jobs, on many types of machines . . . machines that will require quick, accurate tool changing for close tolerance work at high speeds and low costs per piece. Kendex tooling was designed for such conditions. In addition, it increases efficiency; lowers tool investments; sharply reduces maintenance costs. There are over 100 Kendex tools and 35 different Kendex inserts—some stocked in as many as six Kennametal grades.

Why not have a Kennametal tool engineer help you step up efficiency on today's jobs with Kendex "tooling for tomorrow." He works exclusively with Kennametal tooling . . . applying and servicing it. This specialized experience is yours for the asking. KENNAMETAL INC., Latrobe, Pennsylvania.

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Eleven Kennametal Grades . . . To Give You Top Performance

No matter how versatile or rugged the toolholder—final performance depends on the cutting edge. Here's where hard, uniform, dependable Kennametal blanks and inserts will pay off on your operations—regardless of the job or machine. With eleven grades to select from, you can get top performance on every cutting job.

Try Grade K21, the ideal general purpose steel cutting grade that is outperforming all other general purpose carbides, and its companion . . . Grade K5H . . . a hard crater-resistant grade for finish machining at high speeds. Kennametal's simplified grade selection system makes it easy to get the right grade on every job.


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If your interest in powder metallurgy has been aroused by things you've heard about this amazing process—production savings up to 95%, high-density, high-strength structural parts, close tolerances—here is the perfect opportunity to take positive action.

A wealth of information covering much of what you should know about powder metallurgy is now made easily accessible through this bibliography prepared as a service to men responsible for applying latest cost-reducing methods and processes.

It indexes nearly 250 authoritative articles and papers and cross-indexes them under 14 subject headings by operation (pressing, sintering, etc.) and application (bearings, friction mate-

rials, etc.). Most of these references are authored by the technical and practical powder metallurgy experts in the U.S. and Europe.

This bibliography has been compiled in the course of intensive research by Harper engineers and is offered to industry in furtherance of powder metallurgy as an effective competitive weapon.

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Here are the largest and smallest springs made from music wire at National Cash Register Co. The small springs are made of wire .006 inch in diameter and are $\frac{1}{16}$ inch long. The large spring, about four inches long, is made of 57 coils.

◀ Delicate adjustment during final inspection of accounting machine. Keyboard has Japanese characters.

Where Springs Check Up On Dollars

**National Cash Register Uses Johnson's Music Wire
to Make Variety of Springs Vital to Efficient Operation of
Cash Registers, Adding and Accounting Machines**

Algerian merchants in the Casbah and Eskimos in the frozen north, ring up sales on National Cash Registers. In more than 90 countries the whir and jingle of NCR machines keep track of dollars, yen, shillings, and florins—to name just a few.

Whether the NCR product is a cash register, an adding machine or an accounting machine, much of its dependability and efficiency depends on springs. These springs are care-

fully made of high quality music wire supplied NCR by Johnson Steel & Wire Co., a Pittsburgh Steel subsidiary.

More than 2,200 different kinds of standard springs are made in the big Dayton, Ohio, plant of NCR at the rate of one million springs per week. Every one of them is tested before installation.

An intricate machine, like a Class 31 general purpose accounting ma-

chine, has more than 500 springs that help perform precise automatic accounting functions. These semi-custom-made machines must have built-in dependability.

Consider the 12 total lever lock line springs used in this machine. These springs, out of sight behind the carriage, are responsible for several different automatic functions. By setting stops in certain positions, an operator can make the machine



Coiling lever lock line springs on a No. 0 Sleeper & Hartley coiling machine. Thousands are made in a week.



Magnetic inspection on this intricate electronic device at NCR can check all the wire in a coil.

do different jobs with the selector lever springs raising and lowering plungers. If these springs vary in length or if the wire from which they are made varies in diameter, the tensile strength of the various springs will be different. That means the machine will lose the inter-balance between springs which is necessary for its operation.

Each spring is tested to make sure it will perform correctly. The $1\frac{1}{2}$ inch springs are tested with a two ounce load to make sure every one will elongate to exactly $1\frac{7}{8}$ inches.

In NCR's Indicator Department, where a battery of 17 coiling machines makes thousands of these springs a week, $31\frac{1}{2}$ inches of .011 inch wire is coiled into a 73-coil spring which is .156 inch in outside diameter. Loops on each end are formed out of the final two coils.

Because this pre-tested Johnson wire performs well on coiling machines, production is steady and rejects are low. When the finished springs are installed in accounting machines for a proof test, machine assembly proceeds smoothly without hitches due to defective springs.

To make sure that NCR customers don't lose the use of their machines through the failure of a single spring, the company insures its

springs and other parts will give long and accurate job performance. Here's how.

Each coil of wire received from Johnson Steel & Wire is thoroughly tested in the Receiving-Inspection Department by a magnetic inspection device which permits a thorough check of the entire coil—not just samples from each end. Other tests are made in the Materials Laboratory.

Johnson Steel music wire, ranging in size from .005 inch to .016 inch in diameter for NCR uses, meets and exceeds National Cash Register's rigid requirements. As a result, spring rejects on the production line are virtually unknown.

NCR requires music wire that is

uniform in diameter, has a fine surface that is free of seams and has the specified tensile strength. Johnson's conformance to NCR standards enables the company to make springs that will remain in balance with each other for long service.

In your plant, too, Johnson Steel wire will give you the same benefits. Johnson's wide range of wire specialties—everything from music wire to clothes line wire—will perform well on your machines and help you build quality into your product. And you can supplement Johnson products with manufacturers' wire produced at the Monessen Works of Pittsburgh Steel. A phone call today to the nearest district office will bring you prompt action.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

a subsidiary of **Pittsburgh Steel Company**

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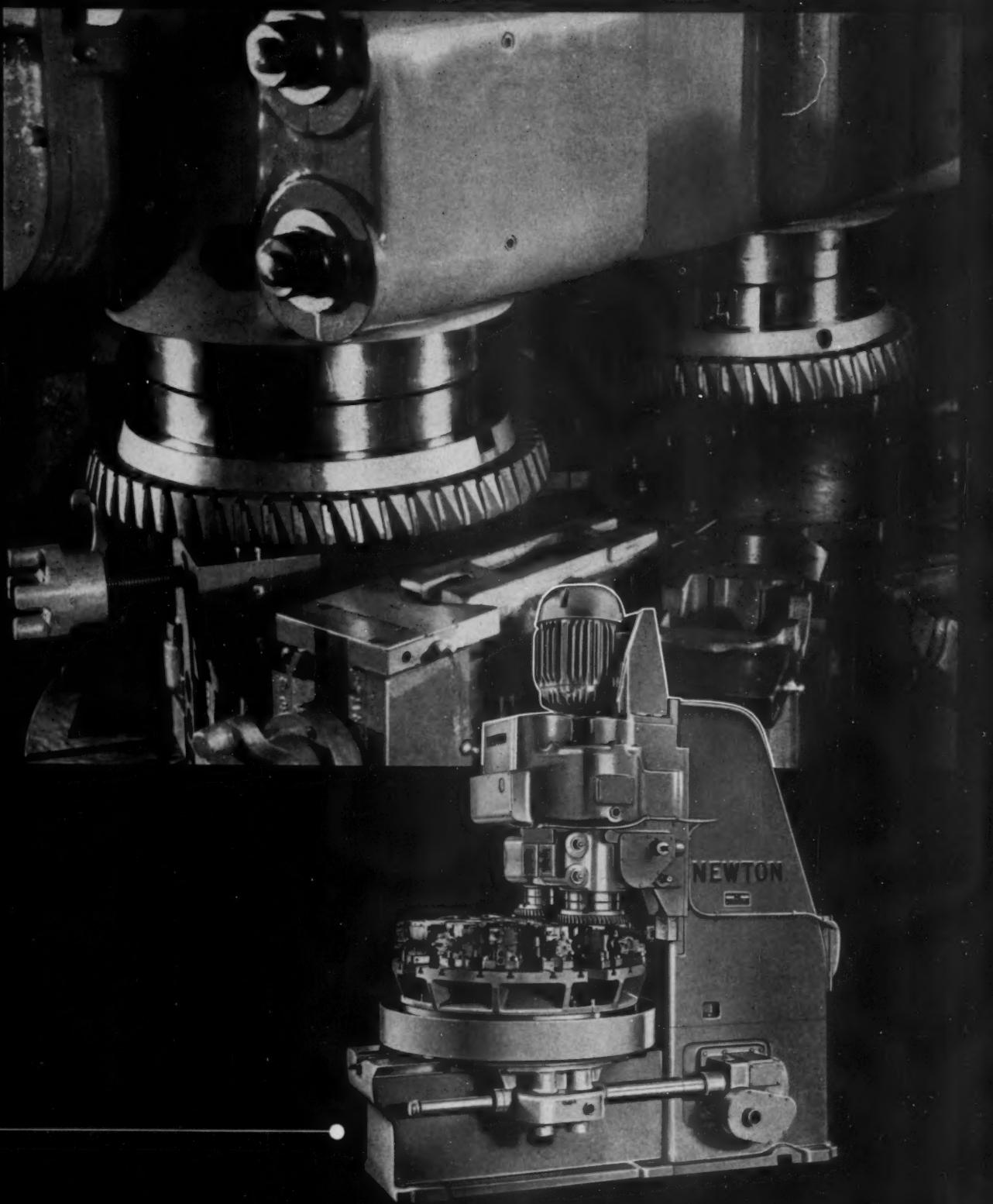
A Method ..

A Newton Vertical Rotary is more than a machine tool—it is a method—the fastest known method of milling the flat surfaces of repetitive pieces.

It is fastest because these machines mill continuously!



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A DIVISION OF FARREL-



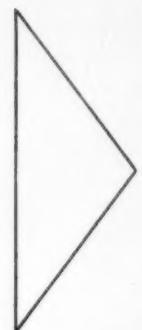
TOOL COMPANY ROCHESTER 10, NEW YORK

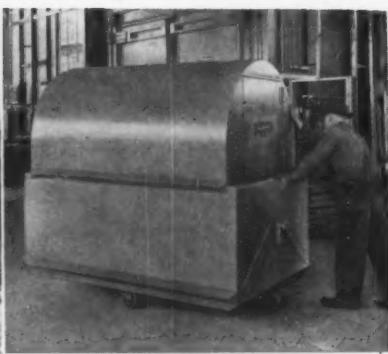
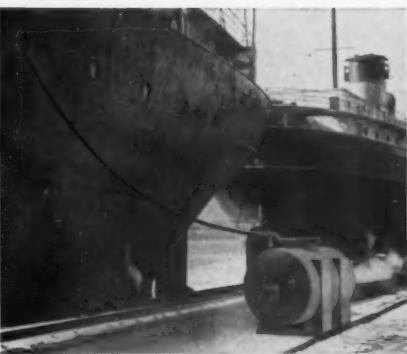
BIRMINGHAM CO., INC.



Here's **MASS-HANDLING** of bulk

What you see above is a Dempster-Dumpster serving one of its detachable containers. Multiply this simple pick up, haul and dump operation by scores of steel containers built to meet your requirements for handling waste or salvable materials, raw and finished products, fluids including acids, combustibles, dusty materials, etc. You have, then, mass-handling of bulk materials with one truck and one man!





Tilt Type Container is handling filter dirt at a plant in Illinois. Note container is equipped with casters and placed under chute, through which the filter dirt passes directly from presses. As each container is filled, it is replaced with an empty one.

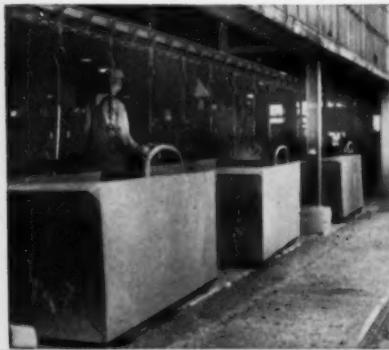
Three heavy duty Drop Bottom Type Containers, shown below, are loaded with cast iron fittings from conveyor at plant in Birmingham. Dempster-Dumpster picks up each container when loaded and hauls the finished products to shipping department.

Tank Type Container is being filled with used oil from a ship. Time required to haul loaded container to reclaim station, drain and return for refilling—10 minutes. Time cycle of the former method using conventional barrels—60 minutes.

Here's another example of the many types of waste materials handled by this system. The Skip Type Container shown below is located under hydropulper at a paper plant. Picture was shot while container was being filled with rope waste sludge.

A loaded Apartment Type Container, equipped with roller bearing casters, is being rolled to outside of this plant building. Dempster-Dumpster will pick it up, haul to disposal area, dump the refuse and return empty container for refilling.

Waste materials are loaded into these Universal Containers at a food plant warehouse. Containers have lids in top, as well as a door in each end, which are opened to make deposits, then closed, sealing materials in container.



materials with one truck...one man!

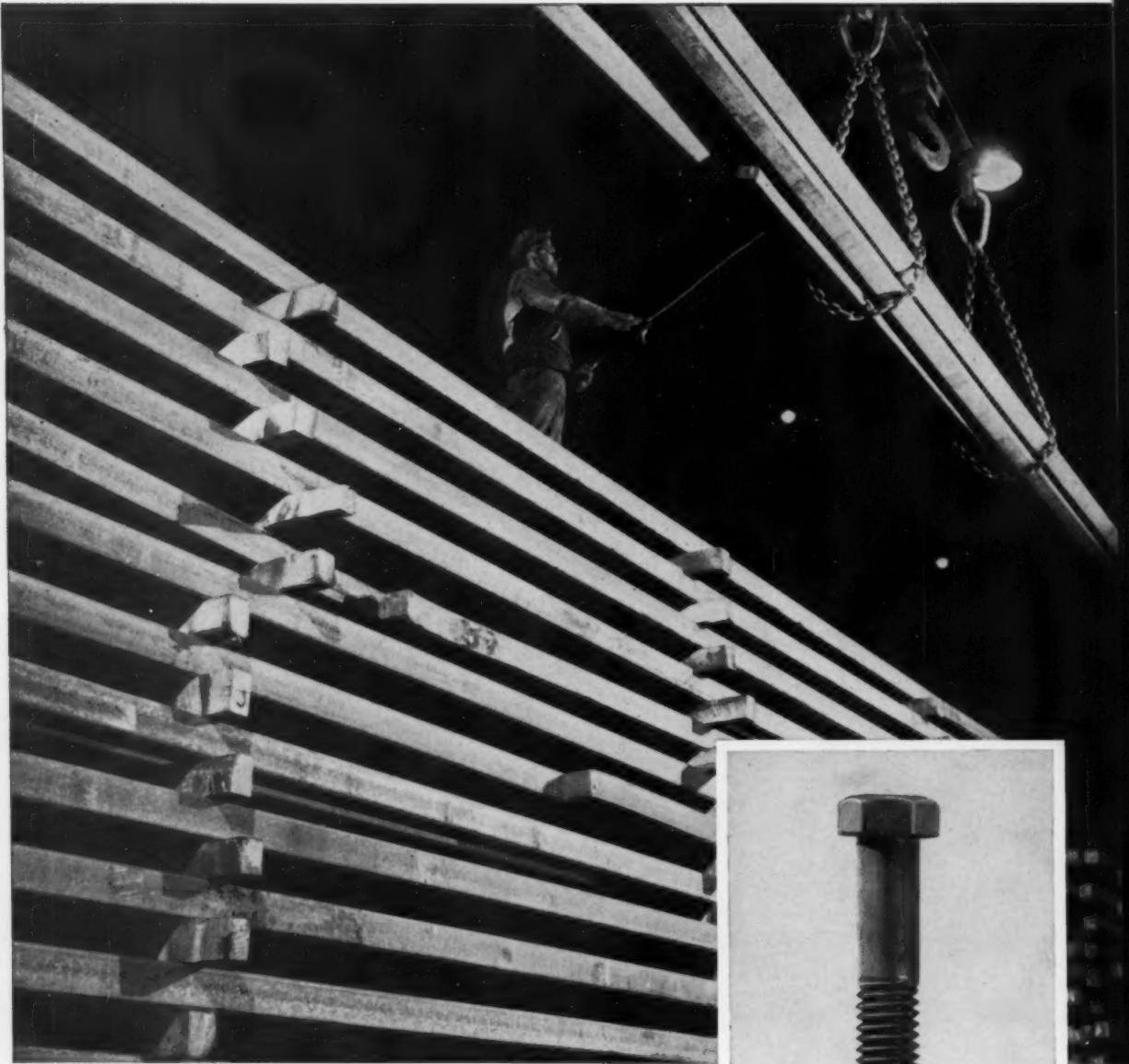
A FEW OF THE HUNDREDS of containers available are shown above in actual service. They are built in capacities up to 21 cu. yds.—several times the capacity of the average dump truck body. One Dempster-Dumpster, operated by only one man, the driver, serves scores of big detachable containers, one after another—handling materials of every description. It's like having one truck with scores of bodies!

Records of performance in dozens of installations prove beyond question that savings are tremendous! The Dempster-Dumpster System cuts costs of equipment and operation. It is common knowledge that one Dempster-Dumpster will perform the work of several conventional trucks, reducing investment ac-

cordingly. This system eliminates standing idle time and re-handling of materials. Once placed in these containers, materials remain there until hauled to destination. Efficiency, sanitation and good plantkeeping are big advantages. Materials to be transferred or disposed of are constantly being placed in the containers as they accumulate. Containers for handling refuse are fire-proof, rat-proof and scavenger proof.

With no obligation on your part, our engineers will be glad to make a comprehensive fact-finding survey to determine the cost-cutting possibilities of this equipment in your plant. Write us for complete information today! Manufactured exclusively by Dempster Brothers, Inc.

DEMPSSTER BROTHERS 436 N. Knox, Knoxville 17, Tennessee



UNIFORM QUALITY OF INCOMING MATERIALS to be used in Republic Bolts and Nuts is assured by coordinated production control. From raw ore to finished cold heading wire, Republic can specify and produce exact steel analyses as required by each fastener's final use. This quality of material is matched by constant manufacturing vigilance at our Bolt and Chain Division to produce your best fastener buy. Mail coupon today for complete story.



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World's Widest Range of Standard Steels

The case for
FASTENER SELECTION

Coordinated production

assures quality in every fastener

How do you select fasteners?

They look alike. They're made to standards. You can't inspect each one before you buy. Yet you have to choose wisely, because your sub-assemblies and assembled products, and, in fact your reputation depend on the reliability of the fasteners you use.

There's a way to be sure of the best. Know your manufacturer.

Mine-to-market coordinated production is your key to quality when you specify Republic Bolts and Nuts. Most fastener makers start their processing with steel in the form of coiled rod. But at Republic, this represents a step midway in the process. Our own teams of metallurgists and inspectors are in complete control of all raw materials from ore mine through blast furnace to the

steel billets delivered to our Bolt and Chain Division. In fact, we make over 50 different analyses of alloy and carbon steels, each one the finest available for the ultimate use of fasteners it will form.

This painstaking protection of raw material quality is matched by rigid quality control throughout our fastener manufacturing processes. As a result, you receive the very finest headed and threaded products modern materials, methods and technology can produce.

So don't just order fasteners, *select* Republic and be sure of the best. Contact your local Republic representative or distributor today. He can draw on a complete range of 20,000 standard, plus 8,000 special types and sizes to fill your needs. Or mail the coupon for further information.



YOUR PRODUCT QUALITY is protected when you use Republic's Berger Division contract manufacturing facilities. Here you can have sheet metal components or products fabricated to your own standards, by experts using modern methods—and Republic quality sheet steel. Check this means of reducing plant and equipment investment. Mail coupon today.



A TOP-QUALITY CHAIN LINE for production use or product application is available through your Republic Chain Distributor. He carries every type and size of welded and weldless chain, chain slings, attachments and accessories. Each is subject to quality control from raw ore to finished product to provide maximum reliability. Coupon will bring full information.



MATERIALS HANDLING EQUIPMENT QUALITY is also backed by Republic's mine-to-market manufacturing control. As a result, the installation shown not only cut handling costs 25%, but will provide long-term, trouble-free service as well. Republic offers a broad line of materials handling equipment to suit your requirements. For illustrated literature, send coupon.

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Does Your Product have this "BUY-SIGN"?

The sign that makes the sale is often this "buy-sign" — the tell-tale American Phillips recessed head screw that says this product was assembled by professionals.

For the presence of American Phillips fasteners is more than a mark of quality, it is the sign of a professional who knows how to do the job best.

More than that, it is a source of profit to the manufacturer, for American Phillips saves money at every turn . . . cuts assembly costs because it drives faster, cuts rejects because the driver can't slip to mar the finished surface.

In fact, American Phillips recessed head screws are so effective in cost-cutting that they can save you up to 50% of your total fastening costs.

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X marks the spot . . . the mark of extra quality

AMERICAN SCREW CO.

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WILLIMANTIC, CONNECTICUT

Plants at Willimantic, Conn., and at Norristown, Pa.
Warehouse and office at Chicago
Office, Detroit, Michigan



Black & Decker®

production tools mean low initial cost, low operating cost, more convenience, less noise—and they're

POWER-BUILT TO LAST!



We don't buy motors—
we build them!

The heart of your electric tool is the motor—completely built by Black & Decker. All the power you need and then some—because each motor is built for a specific tool and the job it must do. B&D motors always stand up!



These B&D production triplets typify the power, speed and accuracy of all Black & Decker tools.

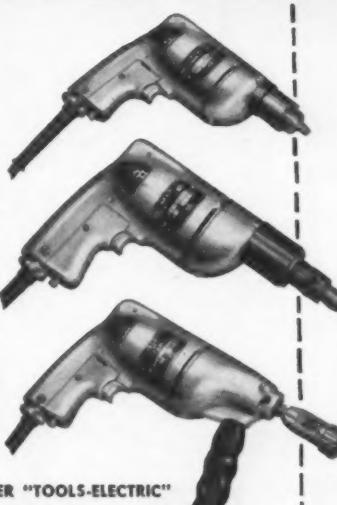
The B&D originated pistol-grip and trigger switch; the lightweight balanced power that reduces operator fatigue and increases production; the sturdy B&D built motor—all teaming up to give you high speed efficiency on the production line. Call your B&D distributor for free demonstration or write to: THE BLACK & DECKER MFG. Co., Dept. 7803, Towson 4, Md.

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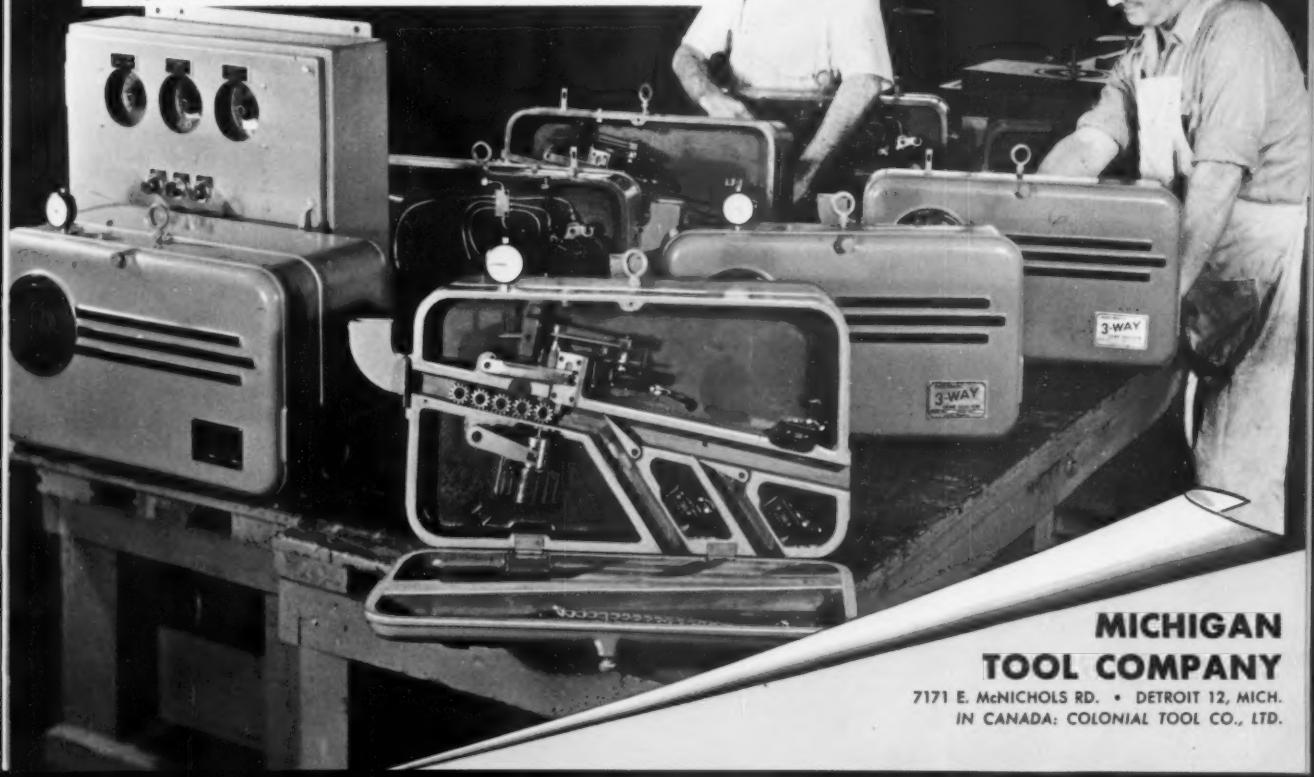
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GEAR PIX



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GEAR PIX



VERSATILE SHEAR-SPEED gear shaper shown here cuts 32 different parts for lift truck transmissions and hoists. Production time is reduced as much as 78%, changeover time is about the same as previous methods. Shown are some of the 32 gears, ratchets, sprockets and splines ranging up to 7 inches in diameter, that are being cut. Parts produced per tool sharpening range from 172 to 1200.

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DESIGNING WITH ALUMINUM

NO. 18

Note—This article contains completely up-to-date information. It replaces your old sheet No. 9.

This is one of a series of information sheets which discuss the properties of aluminum and its alloys with relation to design. Extra or missing copies of the series will be supplied on request. Address: Advertising Department, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California.

PROPERTIES AND CHARACTERISTICS OF ALUMINUM CASTING ALLOYS

CHOOSING the proper aluminum casting alloy and heat-treatment requires a complete knowledge of the service conditions of the part under consideration. The alloys, heat treatments and various casting methods in common use must also be understood.

There are over thirty recognized casting alloys, with as many as five different heat-treatment possibilities for some. This results in a large number of choices from which to satisfy individual requirements. Because of these many alloy and heat-treatment combinations the possible range of typical mechanical properties varies widely.

Frequently, commercial castings do not have critical service requirements, and in such cases the foundryman should be consulted to ascertain the most economical alloy and production method which will do the job.

However, in most instances castings are designed for maximum efficiency, and in such cases, the alloy and heat treatment must be carefully selected from those available. In doing this, the designer, with his greater knowledge of the service requirements for the casting, must confine the choice of alloys to those which provide the necessary properties. He must then be guided by the foundryman in the final choice, as the alloy which looks best in the tables may have some production characteristics which would make it less desirable on an overall basis than other eligible alloys. The foundryman is in the best position to advise on such factors as availability, relative ingot costs, production costs and reproducibility of results. When this is coordinated with the designer's knowledge of service requirements such as strength, hardness, corrosion resistance, impact strength and machinability, the best possible selection will result.

As a result of this coordination, changes from initial design may be indicated which will improve design efficiency, or lower production costs, or both. For instance, a casting having sound design from every other standpoint may have a size or shape pointing

to problems of distortion in heat treating which could be minimized through design changes.

Factors to Consider

The production and service requirements have a large bearing on the casting method, as do size and shape of part. For example, castings required in fairly large numbers, should be made either by permanent mold or die casting process, provided the size and design features of casting and available alloys are suitable.

The sand casting process is usually confined to producing parts required in small quantities, those having hollow cavities and complex arrangement of ribs, pockets, etc., and to those whose size makes them unsuited for casting in metal molds. In many cases it will be advantageous to redesign a part to make it adaptable for production by either permanent mold or die casting method. Sand casting usually requires minimum tooling charge, but unit price of castings and the finished part is high. Permanent molding and die casting involves higher tooling charge, but unit price is lower, particularly for longer runs. Die castings are the extreme, usually involving highest tooling charge and lowest piece price on large quantities.

Once the casting method is determined, the alloy choice is narrowed down appreciably.

Next to be considered are the service requirements. If high strength is necessary, that ordinarily eliminates the non-heat-treatable alloys when using an efficient design. This can be further and rapidly narrowed down when the remaining requirements such as leak tightness, corrosion resistance, machinability and others are considered.

In some instances, one certain property may be required to the maximum degree—for example, highest possible yield strength. This immediately narrows down the alloy and heat treatment choice as well as casting method to a possible one or two, and bigger compromises will have to be made for the other

requirements, particularly ductility.

In other cases the large size and shape of a casting may not permit the use of a "solution heat-treatment," but will limit it to use of a "straight aging treatment" taking place in approximate temperature range of 300°F to 500°F, or to no treatment at all, thereby sacrificing, to a degree, some of the mechanical properties and slightly decreasing machinability.

The reason for this limitation is the fact that the first half of a solution heat-treatment takes place at a temperature ranging between 930°F to 1,000°F, followed by rapid quench in water. At those temperatures, the mechanical strength of aluminum is practically zero and therefore large unsupported areas of the casting, or the whole casting at times, may sag or distort from its own weight. Sometimes the size and shape of part are such that it can withstand the effects of the high temperatures but cannot be quenched without danger of warping or cracking.

Die castings are always used in the as-cast condition, which limits the choice to one of alloy selection only.

To assist the designer in becoming familiar with the various casting processes, mechanical properties, and physical properties we refer him to these tables on the following pages:

Table #1—Typical Mechanical Properties of Aluminum Sand Castings

Table #2—Typical Mechanical Properties of Aluminum Permanent Mold Castings

Table #3—Typical Mechanical Properties of Aluminum Die Castings

Table #4—Alloy Selection Guide

Sand casting, permanent mold casting, and die casting are the more widely used production methods. However, in special cases the part may be produced more efficiently by other methods such as shell molding, plaster molding, investment casting or centrifugal casting.

CONTINUED ON NEXT PAGE ➤

SAND CASTING ALLOYS—TABLE 1

Alloy	H. T. ¹	Typical Mechanical Properties ²					Casting and Service Characteristics ³						
		Tensile Strength psi	Yield Strength psi	Elongation Per Cent in 2"	Hardness Brinell 10/500	Fatigue psi	Feeding Ability	Pressure Tightness	Hot-Shortness	General Castability	Machinability	Corrosion Resistance	
43	AC	19,000	8,000	8.0	40	6,500	E	E	SL	E	F	VG	E
108	AC	21,000	14,000	2.5	55	8,000	VG	VG	MIN	VG	G	G	VG
122	T2	27,000	20,000	1.0	80	9,500	G	G	MOD	G	E	F	F
122	T61	41,000	40,000	(")	115	8,500	G	G	MOD	G	E	F	F
142	T21	27,000	18,000	1.0	70	6,500	G	F	AP	F	VG	F	F
142	T571	32,000	28,000	.5	85	8,000	G	F	AP	F	VG	F	F
142	T77	28,000	25,000	2.0	75	9,500	G	F	AP	F	VG	F	F
195	T4 ⁵	32,000	16,000	8.5	60	6,000	G	G	AP	F	G	G	F
195	T6	36,000	24,000	5.0	75	6,500	G	G	AP	F	VG	G	F
195	T62	40,000	30,000	2.0	90	7,000	G	G	AP	F	E	G	F
212	AC	23,000	14,000	2.0	65	8,000	G	G	MOD	G	E	F	G
214	AC	25,000	12,000	9.0	50	5,500	F	F	MOD	F	E	E	G
B214	AC	20,000	13,000	2.0	50	.....	F	F	MOD	G	E	E	G
F214	AC	21,000	12,000	3.0	50	.....	F	F	MOD	F	E	E	G
220	T4	46,000	25,000	14.0	75	7,000	F	F	MOD	F	E	E	F
319	AC	27,000	18,000	2.0	70	10,000	E	E	SL	E	G	G	G
319	T6	36,000	24,000	2.0	80	10,000	E	E	SL	E	G	G	G
355	T51	28,000	23,000	1.5	65	7,000	E	E	SL	E	E	VG	VG
355	T6	35,000	25,000	2.5	80	8,500	E	E	SL	E	E	VG	VG
355	T61	39,000	35,000	1.0	90	.....	E	E	SL	E	E	VG	VG
355	T7	38,000	36,000	0.5	85	8,500	E	E	SL	E	E	VG	VG
355	T71	35,000	29,000	1.5	75	10,000	E	E	SL	E	G	VG	VG
356	T51	25,000	20,000	2.0	60	7,500	E	E	SL	E	G	E	VG
356	T6	33,000	24,000	4.0	70	8,000	E	E	SL	E	G	E	VG
356	T7	34,000	30,000	2.0	75	.....	E	E	SL	E	E	E	VG
356	T71	28,000	21,000	4.5	60	.....	E	E	SL	E	G	E	VG

NOTES:

- Properties determined on standard tensile test bars cast under favorable conditions and properly heat-treated, when applicable.
- Ratings: E, excellent; VG, very good; G, good; F, fair—apply to all castings and service characteristics except Hot-Shortness; AP, appreciable; MOD, moderate; MIN, minor; SL, slight.
- AC, as cast.
- On standing at room temperature for several weeks, properties approach those of T6 condition.
- Weld before heat-treating, using appropriate filler rod.
- Less than 0.5% elongation.

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PERMANENT MOLD CASTING ALLOYS—TABLE 2

Alloy	H. T. ³	Typical Mechanical Properties ¹					Casting and Service Characteristics ²						
		Tensile Strength psi	Yield Strength psi	Elongation Per Cent in 2"	Hardness Brinell 10/500	Fatigue psi	Feeding Ability	Pressure Tightness	Hot-Shortness	General Cast-ability	Machin-ability	Corrosion Resistance	Weld-ability ⁴
43	AC	23,000	9,000	10.0	45	.....	VG	E	SL	E	F	VG	E
A108	AC	28,000	16,000	2.0	70	.....	VG	VG	MIN	VG	G	G	VG
122	T52	35,000	31,000	1.0	100	.....	G	G	MOD	G	E	F	F
122	T551	37,000	35,000	.....	115	8,500	G	G	MOD	G	E	F	F
122	T65	48,000	36,000	.....	140	9,000	G	G	MOD	G	E	F	F
A132	T551	36,000	28,000	.5	105	13,500	G	VG	MIN	G	F	G	G
A132	T65	47,000	43,000	.5	125	.....	G	VG	MIN	G	F	G	G
D132	T5	36,000	28,000	1.0	105	13,500	VG	VG	MIN	VG	G	F	G
138	AC	30,000	24,000	1.5	100	.....	.....	G	MIN	F	G	.....	.....
142	T571	40,000	34,000	1.0	105	10,500	F	F	AP	F	VG	G	F
142	T61	47,000	42,000	.5	110	9,500	F	F	AP	F	VG	G	F
B195	T4 ^c	37,000	19,000	9.0	75	9,500	G	G	MOD	G	G	G	G
B195	T6	40,000	26,000	5.0	90	10,000	G	G	MOD	G	G	G	G
B195	T7	39,000	20,000	4.5	80	9,000	G	G	MOD	G	G	G	G
A214	AC	27,000	16,000	7.0	60	.....	F	F	AP	F	E	E	G
319	AC	34,000	19,000	2.5	85	.....	E	E	SL	E	G	G	G
319	T6	40,000	27,000	3.0	95	.....	E	E	SL	E	G	G	G
355	T51	30,000	24,000	2.0	75	.....	E	E	SL	E	VG	VG	VG
355	T6	43,000	27,000	4.0	90	10,000	E	E	SL	E	VG	VG	VG
355	T62	45,000	40,000	1.5	105	10,000	E	E	SL	E	E	VG	VG
355	T7	40,000	30,000	2.0	85	10,000	E	E	SL	E	VG	VG	VG
355	T71	36,000	31,000	3.0	85	10,000	E	E	SL	E	VG	VG	VG
356	T6	40,000	27,000	5.0	90	13,000	E	E	SL	E	G	E	VG
356	T7	33,000	24,000	5.0	70	11,000	E	E	SL	E	G	E	VG
363	AC	35,000	23,000	2.7	85	.....	E	VG	SL	E	E	G	E
363	T6	48,000	28,000	6.5	90	.....	E	VG	SL	E	E	VG	E
750	T5	20,000	8,500	10.0	45	9,000	.....	.....	.....	.....	E	.....	.....

NOTES:

- Properties determined on standard tensile test bars cast under favorable conditions and properly heat-treated, when applicable.
- Ratings: E, excellent; VG, very good; G, good; F, fair—apply to all castings and service characteristics except Hot-Shortness; AP, appreciable; MOD, moderate; MIN, minor; SL, slight.
- AC, as cast.
- On standing at room temperature for several weeks, properties approach those of T6 condition.
- Weld before heat-treating, using appropriate filler rod.

(Advertisement)

DIE CASTING ALLOYS—TABLE 3

Alloy	Condition ¹	Typical Mechanical Properties ²					Casting and Service Characteristics ³					
		Tensile Strength psi	Yield Strength psi	Elongation Per Cent in 2"	Hardness Brinell 10/500	Fatigue psi	Mold Filling Capacity	Hot-Shortness	Die Solder Tendency	Machinability	Corrosion Resistance	Weldability
13	AC	39,000	21,000	2.0	.....	19,000	E	VL	E	F	VG	not recommended
A 13	AC	35,000	16,000	3.5	.....	.....	VG	VL	VG	F	VG	.....
43	AC	30,000	16,000	9.0	.....	17,000	G	MIN	F	F	VG	.....
218	AC	45,000	27,000	8.0	.....	23,000	F	AP	F	E	E	..
360	AC	44,000	27,000	3.0	.....	19,000	E	VL	G	F	G	..
A360 ⁴	AC	41,000	23,000	5.0	.....	18,000	E	VL	G	F	E	..
380	AC	45,000	26,000	2.0	.....	20,000	E	MOD	E	G	G	..
A380 ⁴	AC	46,000	25,000	3.0	.....	19,000	E	MOD	E	G	G	..
384	AC	46,000	27,000	1.0	.....	21,000	E	MOD	E	G	G	..

NOTES:

1. Properties determined from standard test bars cast under favorable conditions.
 2. Ratings: E, excellent; VG, very good; F, fair—apply to all castings and service characteristics except "hot-shortness"; AP, MOD, MIN, VL apply to "hot-shortness" only.

3. As cast.

4. In A360 and A380, the iron content is controlled more closely than in 360 and 380 alloys.

SELECTION GUIDE—TABLE 4

Major Property Wanted	Sand Cast	Perm. Mold	Die Cast
General purpose—	43	43	13
Low strength	108	A108	A 13
arranged in order of decreasing castability	212	A214	43
214			
General purpose—	355-T6	355-T6	380
Heat-treated⁵	356-T6	356-T6	A380
good balance of all properties for most applications	319-T6	319-T6	360
	195-T6	B195-T6	A360
Best castability for complex castings with thin sections—	43	43	A360; 360
arranged in order of decreasing castability	319	319	A 13; 13
356	356	43	
108	M108		
355	355		
High ductility and shock resistance arranged in order of decreasing properties	220-T4	A214	218
	195-T4	B195-T4	A360
214 ⁶	356-T6	363-T6	43
	356-T6	363-T6	
319	319		
43	43		
Pressure tight—Low stressed	43	43	A360
	108	A108	A 13
	319	319	43
Pressure tight—High stressed	356	356	A360
	355	355	
	319	319	
	363		

Major Property Wanted	Sand Cast	Perm. Mold	Die Cast
Corrosion Resistance	43	43	218
	214	A214	A360
	220	356	
	356	355	
	355	319	
	319	363	
Ornamental and Architectural Applications —also food handling, dairy equipment, cooking utensils and marine fittings	43	43	43
	214 ⁷	A214 ⁷	218 ⁷
	B214 ⁷		
	F214 ⁷		
Piston Alloys —good properties at operating temperatures	122	122	384
	142	A132	85
		D132	
		142	
Other alloys having good properties at moderate temperatures	214	138	13
		A214	360
Good machinability—	122	122	218
Heat-treated castings machine better than those in as-cast condition, and generally those having highest hardness machine better than the softer ones in any one alloy	212	355	380
	214	363	A380
	B214	A214	
	F214	A108	
	220-T4	319	
	195		
	319		

NOTES:

1. Except die castings.
 2. These alloys take anodized finish without appreciable discoloration.

More detailed assistance with design, alloy selection, fabrication, and heat-treatment procedure is obtainable through any Kaiser Aluminum sales office located in principal cities, or write to Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California.

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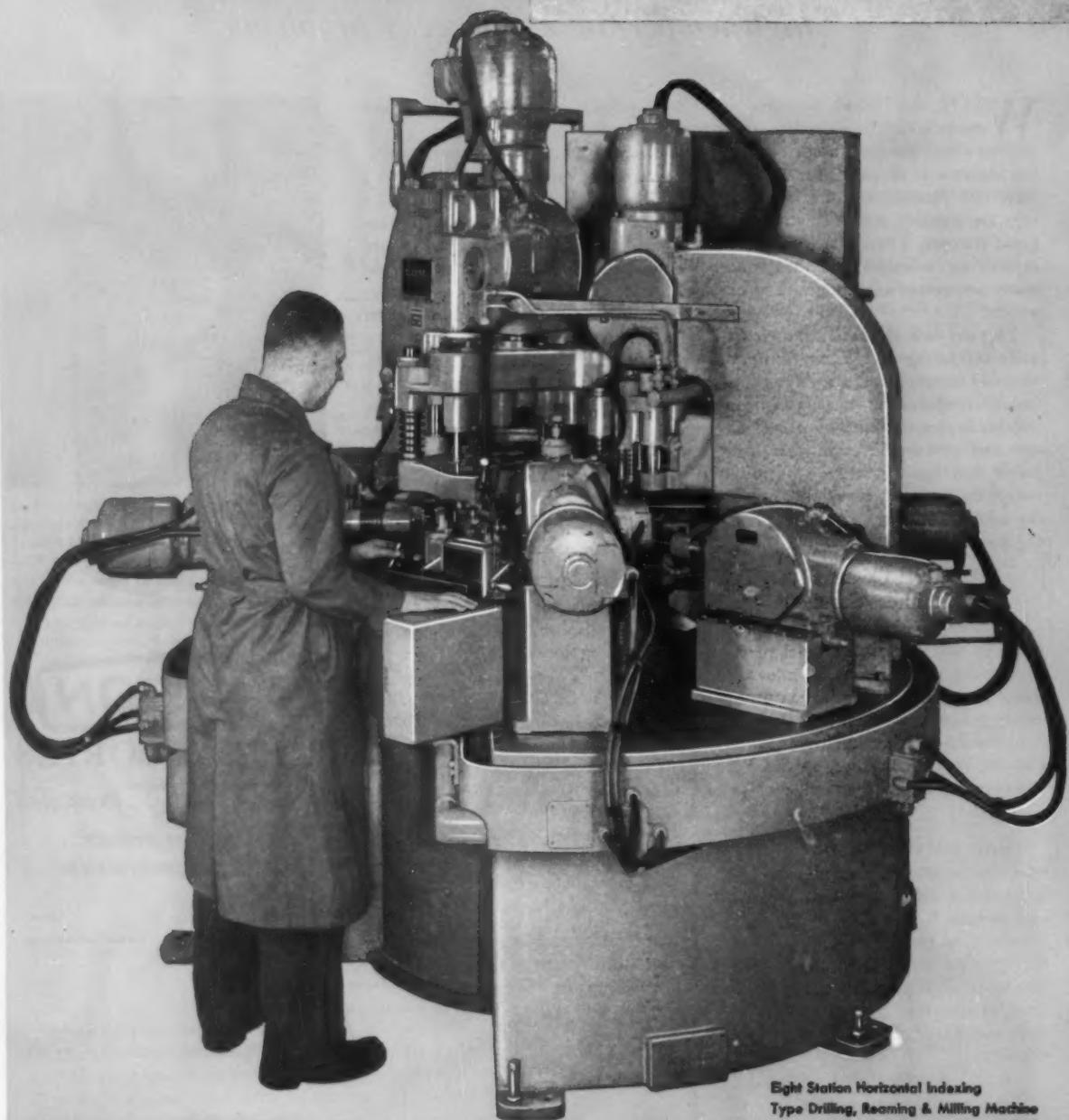
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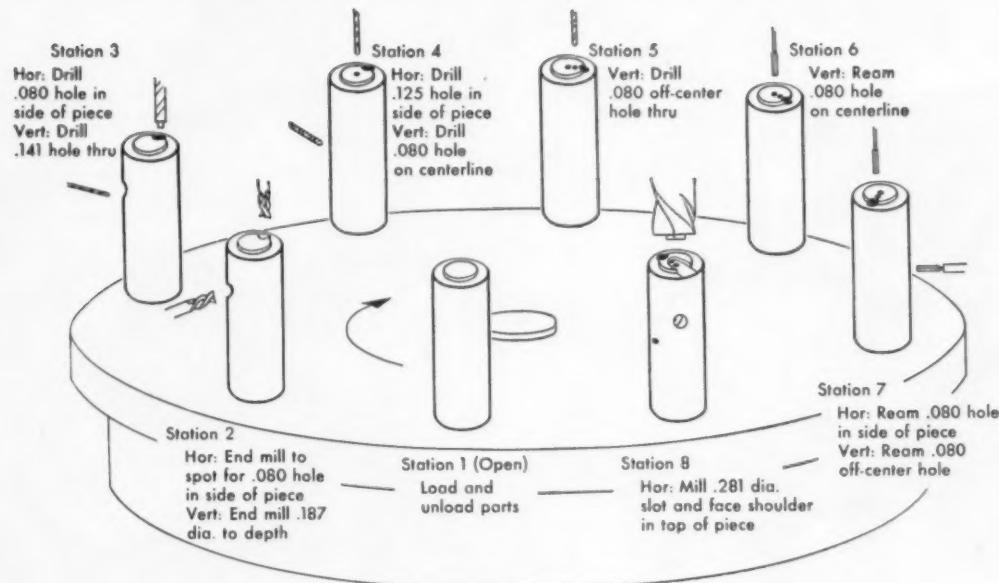
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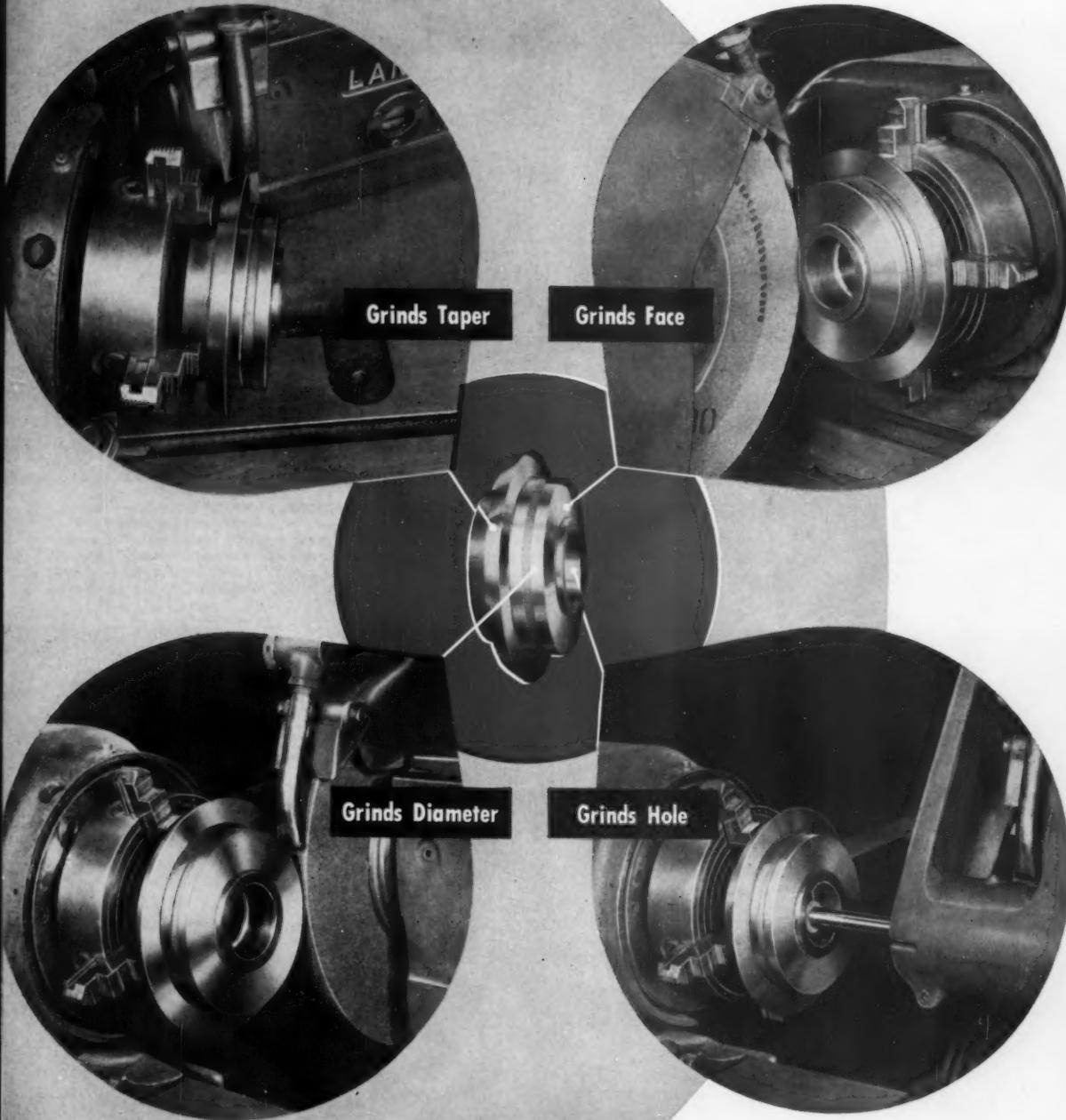
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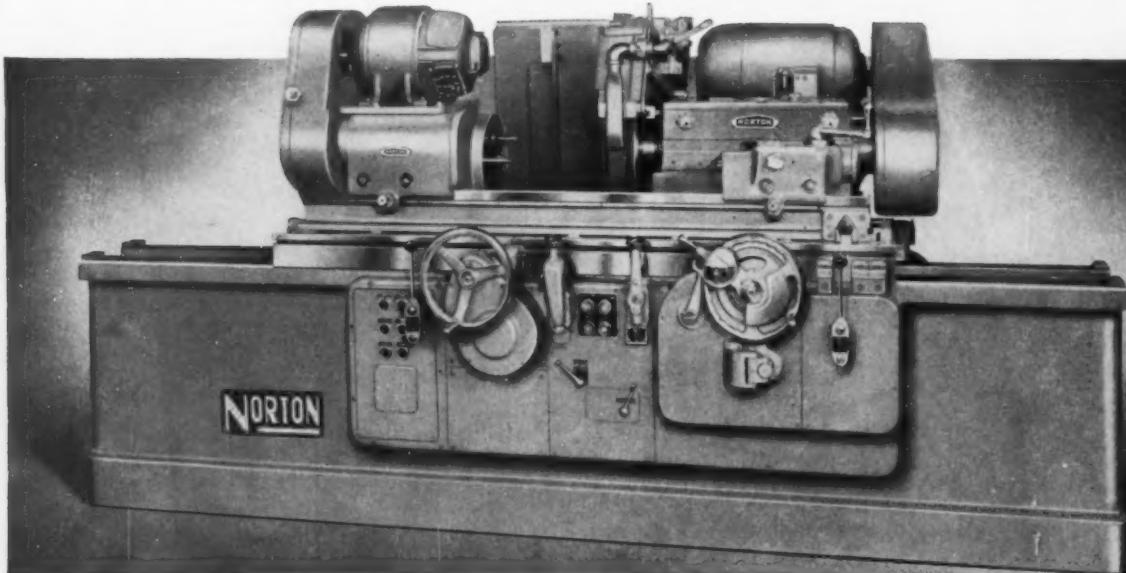
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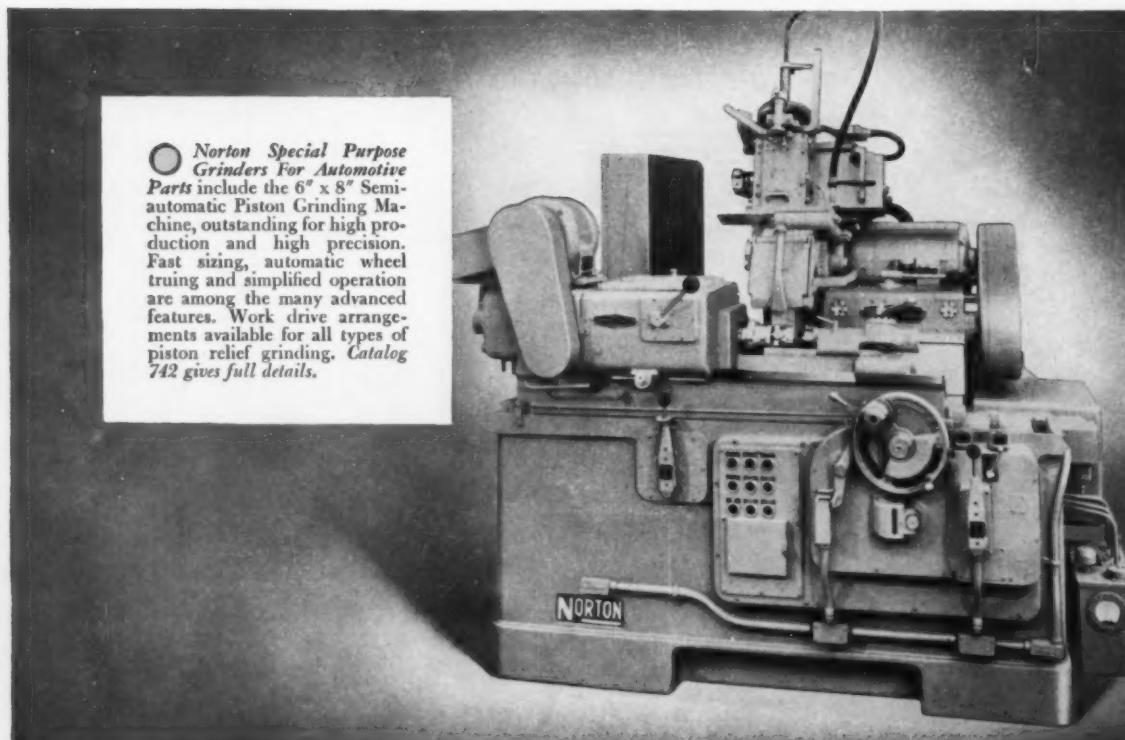
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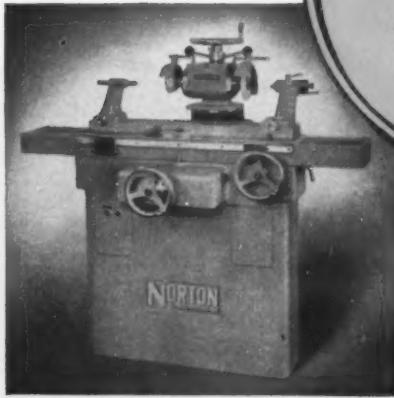
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Norton Surface Grinders are well represented by this 8" x 24" Hydraulic Grinder. Designed with both hand and power table traverse and cross feed, it produces plane surfaces smoothly and speedily. Convenient controls and easy accessibility keep operating and maintenance times low. Extra equipment, such as magnetic chucks, wet grinding attachment and individual dust exhaust system meet all operating conditions. Write for Catalog 190.



Norton Tool Room Cutter Grinders. The No. 20 Cutter and Tool Grinder is the most versatile machine in its class. The wheel head tilts up to 15° above or below horizontal, and may be swivelled through 360° — simplifying such jobs as grinding taper reamers, step counterbores, form tools and milling cutters. Other pace-setting advantages include long table traverse and wheel slide travel . . . integral motor spindle . . . wheel slide graduated dials readable from any angle. No other cutter and tool grinder does so many jobs so fast, so easily. Catalog 189 tells you why.

Only Norton offers you such long experience in both grinding machines and wheels to help you produce more at lower cost.

The six machines shown here are typical products of that experience — bringing you ahead-of-the-parade design that speeds production and adds maximum product-value on every job they do for you.

But remember — these six advanced machines represent only a small fraction of the world's broadest line. Besides many models of cylindrical, surface, crankshaft and camshaft grinding machines, Norton produces a wide range of lapping machines, tool room grinders and special types for grinding pistons, valves, jet parts, etc.

A new illustrated folder #1843 lists the entire Norton line of grinding and lapping machines and tells you how to get all the facts on each unit. For your copy, write to NORTON COMPANY, Machine Division, Worcester 6, Mass. In Canada: J. H. Ryde Machinery Co., Ltd., Toronto 5.

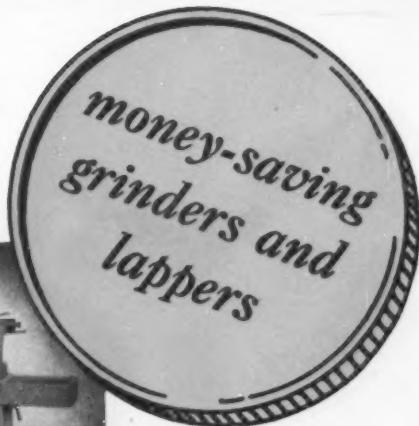
To Economize, Modernize With NEW

NORTON

GRINDERS and LAPERS

Making better products... to make other products better

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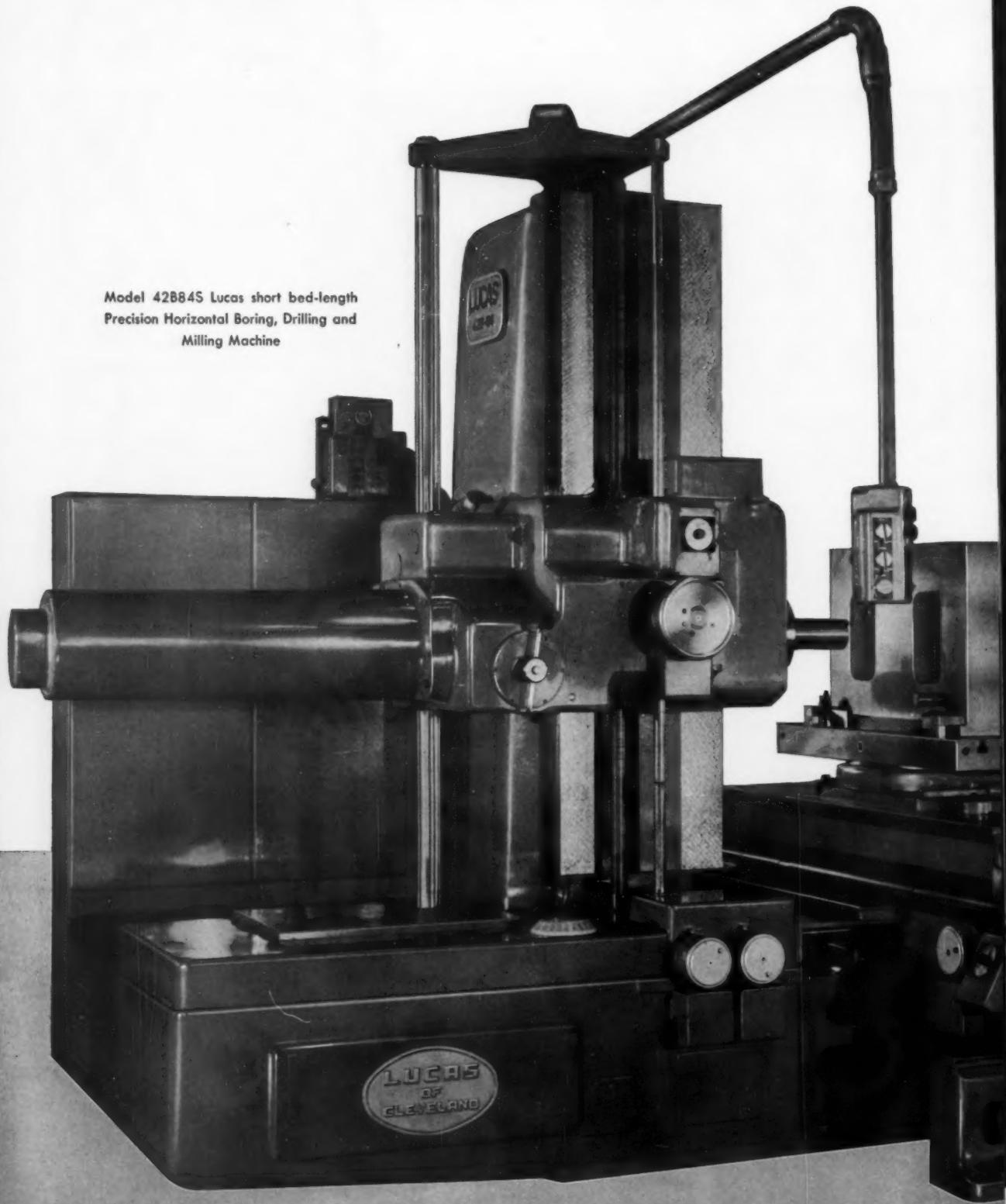
Norton Lapping Machines. The Type 16FC Vertical Lapper brings you outstanding production capacity

for such work as diesel injector parts, plug gages, size blocks, sides of small bearing races, pump gears and plates and many other parts. Laps flat work up to 3" x 5", and cylindrical work up to 3" diameter, producing a high degree of accuracy and finish. Catalog 212 gives you details.



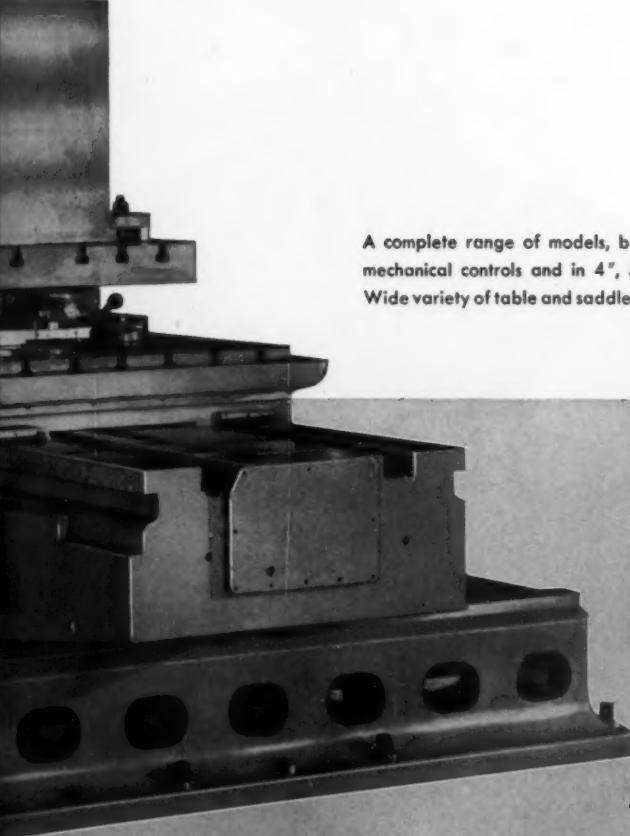
Norton 10" Universal Grinders. The 10" x 20" Universal Grinder has the flexibility to handle an almost endless variety of jobs. Compound swivel arrangement of wheel head enables you to make separate angular settings of wheel and feed. External, internal, face or angular wheel slide operations are easy. Chuck may be mounted on one end of work head spindle, ready for use by turning head 180°. Write for Catalog 170.

Model 42884S Lucas short bed-length
Precision Horizontal Boring, Drilling and
Milling Machine



more Lucas in less space

This new horizontal boring, drilling and milling machine is a space and money saver on work where a backrest is not required. Lucas leads the parade by concentrating all its efforts on horizontal boring machines—by constant improvement, by incorporating every advance immediately. Every worthwhile improvement will be found first in a Lucas. Lucas Machine Division • The New Britain Machine Company, 12302 Kirby Ave., Cleveland 8, Ohio.

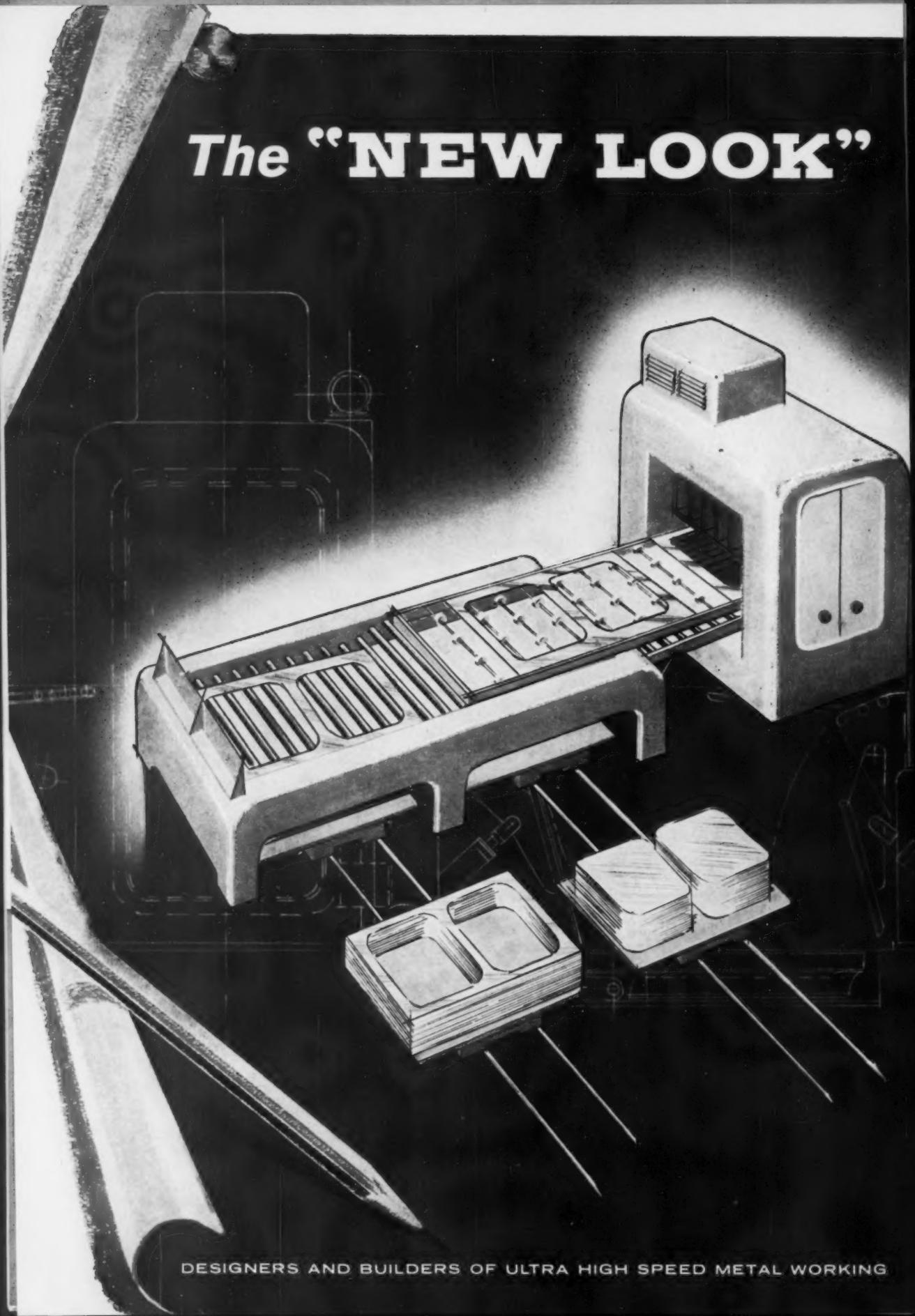


A complete range of models, built in 3", 4" and 5" spindle sizes with mechanical controls and in 4", 5" and 6" sizes with electrical controls. Wide variety of table and saddle sizes with two- or four-way beds optional.

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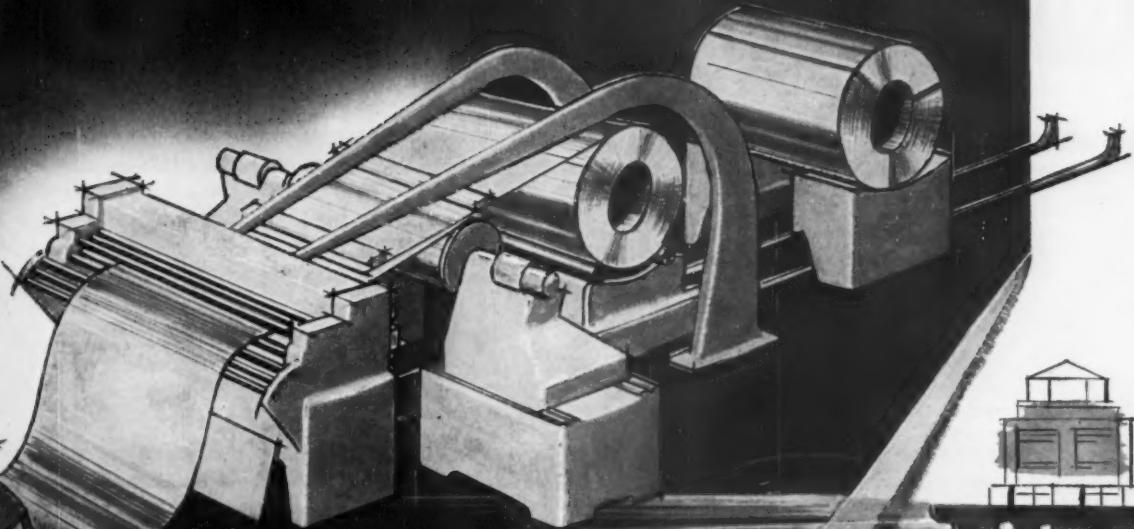
A DIVISION OF
THE NEW BRITAIN MACHINE COMPANY

The "NEW LOOK"



DESIGNERS AND BUILDERS OF ULTRA HIGH SPEED METAL WORKING

in Production Stamping



AUTOMATION for the pressroom is just around the corner according to a number of the nation's leading press experts who have studied the revolutionary "Flying Press" approach recently announced by the Wean Equipment Corporation.

Taking a coil of steel directly from the mill, the Wean Flying Press Line decoils, levels, measures, blanks, sorts, counts and piles the finished piece on trans-car ready to be rolled to the next operation — at a speed heretofore considered unobtainable.

Present engineered lines will handle coils up to 72 inches in width — cutting lengths from 12 inches to 8 feet.

Some of the more outstanding features of the line: floor mounted for quick, inexpensive installation with built-in die loading mechanism; a new coil sticker that eliminates manual threading; a high speed, non-scratch piling mechanism and several newly developed "automated" devices that assure a continual flow of metal through the press.

If low cost, mass production stamping appeals to you, why not contact a Wean Equipment engineer for full particulars? Write direct or call the Wean office in Chicago, Detroit or Newark, N. J.

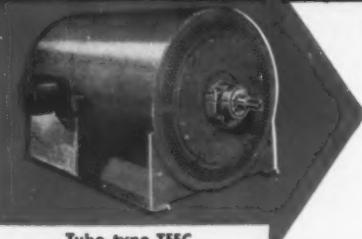
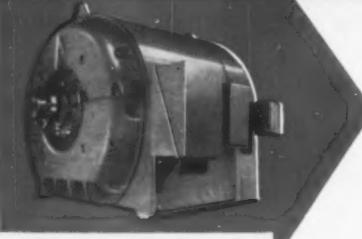
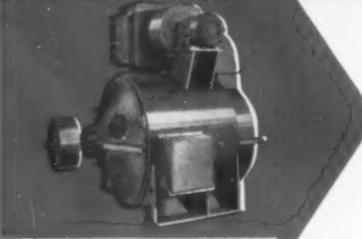
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Wean

EQUIPMENT CORPORATION
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Cable: WEANCOR



Choose the Exact Motor You Need

INDUCTION	Performance Characteristics	Protection	Applications
	Single or multi-speed. Wound-rotor design for variable speed operation. Available with low starting current, high starting torque and other special characteristics.	Open; drip-proof; splash-proof or weather-protected; enclosed, self or forced-ventilated; totally-enclosed, fan-cooled; totally-enclosed, water-cooled; explosion-proof.	Fans, blowers, machine tools, pumps, material handling and auxiliary equipment, compressors, m-gsets, general purpose use. Wound-rotor for variable speed where speed range is not too great.
SYNCHRONOUS	Performance Characteristics	Protection	Applications
	Constant speed under all load conditions. Excellent for low speed. High efficiency under all loads. Unity or leading power factor.	Open; drip-proof; splash-proof or weather-protected; enclosed, self or forced-ventilated; totally-enclosed, fan-cooled; totally-enclosed, water-cooled; explosion-proof.	Can be used for almost any type of constant speed drive. Frequently used where power factor correction is necessary.
DIRECT-CURRENT	Performance Characteristics	Protection	Applications
	Stepped or stepless wide range speed variation. Reversing or non-reversing. Dynamic or regenerative braking.	Open; protected; drip-proof; splash-proof; forced-ventilated from attached or separate blower; enclosed, water-cooled.	Rolling mills, processing lines, wire mills, machine tools, and other machines requiring wide range of speed adjustment with constant and variable torque and horsepower.

BECAUSE ALLIS-CHALMERS BUILDS A COMPLETE LINE of motors for the metal industries, you can select exactly the performance characteristics and protection you need.

For more information or for engineering assistance, call your nearby A-C District Office or write for bulletins on motors you need. Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4571



**Send for this free
engineering information:**

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Larger sizes
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05B7649

Direct-current
motors
05B6002

ALLIS-CHALMERS

NEWSFRONT

All-Aluminum Radiator Not Far Off

Time table for the all-aluminum auto radiator has been given a king size push. A hybrid version, using both copper and aluminum, is tentatively scheduled for trial in at least one of next year's expensive models. With the trend set, there's little likelihood of reversal. Step up is due to new and unexpected developments in metal strip fabrication which eliminates most, if not all, the headachy aluminum brazing problems.

Sales Go Hand In Hand

Watch the capacitor, the midget partner of the more publicized transistor. When transistor sales go up, so do capacitor sales. With a booming domestic market that is still growing, export markets for capacitors are expected to double and even treble this year.

What's The Stumbling Block?

It's always hard to tell beforehand which one of steel labor's contract demands are tossed in for bargaining purposes. But if union leaders are serious about premium pay, resistance will be strong. Companies estimate the cost at around 25¢ an hour. The demand could be a real stumbling block to labor peace this year.

Branch Engineering An Asset

A leading Ohio tool and die firm is reaping benefits from a branch engineering setup. By building up its branch offices into local engineering groups working independently of the home office, more and better ideas are generated. It has also led to better utilization of local engineering talent, mixing with a greater variety of engineering groups and more intimate integration with customers.

Switch To Shell Molding

Pontiac is switching exclusively to shell molded crankshafts for its engines. It's the first of GM's divisions to do so in regular production. Reason for the change is ease of machining, plus a considerable reduction in tool and material costs.

Will Larger Pellets Cut Steel Cost?

Taconite may mean cheaper steel—even cheaper than better blast furnace burden would make possible. At least three major steel companies are quietly experimenting with larger-than-present pellets for an openhearth charge. Idea is to substitute the high iron content pellets in large diameters for at least some of the scrap charge in openhearts, and maybe even in electrics.

Test Noise Effects On Deaf Workers

Navy is running a series of tests to determine whether high noise levels effect totally deaf workers. If not, the service will use them around jet engines producing sounds of 130 decibels, and may get to 170 decibels. This noise level is higher than humans with hearing can stand.

Isotopes Do Big Job For Industry

With the use of radioisotopes, equipment costing about \$3,000 can do jobs which otherwise would require equipment valued at about \$50,000. Moreover, such equipment often does the job faster, more simply and under rugged conditions. More than 1200 firms are now using isotopes for process control, preventive maintenance product trouble-shooting and radiological inspection. Industrial savings through the use of isotopes are reported to be in the \$100 million range.

Nickel Guards Plane Propellers

Nickel thinly plated on propeller blades by a new process protects props of Navy planes from damage by water spray, stones and debris. Coating was first used on aluminum props of flying boats. Through changes in the bonding agent, nickel plating is now used on steel blades of land-based planes.

Cold Extrusion Gets Design Push

One leading Eastern fabricator is making a strong pitch to design engineers to consider cold extrusions when drawing up parts. Slight design modifications permit manufacture by cold extrusion without sacrificing functional quality.

Bliss chooses TIMKEN® bearings for extra-big loads in world's largest knuckle-joint press

WHEN its customer needed a press to coin cups for artillery shell cases, Bliss created the largest knuckle-joint press ever built—a 4000-ton giant that not only costs less, but actually outproduces a greater-capacity press in this application.

Bliss engineers specified Timken® tapered roller bearings on press drive shaft and flywheel because Timken bearings have the capacity for unusually heavy loads, are built for long trouble-free life.

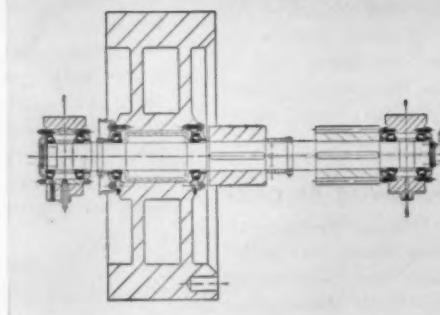
Full line contact between rollers and races gives Timken bearings their remarkable load-carrying capacity. Made of Timken fine alloy steel, they normally last the life of the machine.

Tapered construction enables Timken bearings to carry any combination of radial and thrust loads. They hold shafts rigid—keep moving parts in proper alignment. Effective closures retain lubricant and keep out destructive dirt, so that maintenance is reduced to a minimum. Manufactured to extreme limits of precision and finished to incredible smoothness, Timken bearings practically eliminate friction.

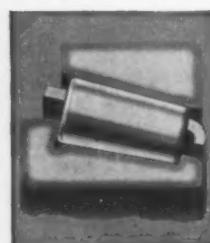
In every machine you build or buy, get all the advantages only Timken bearings can give you—look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means
its bearings are the best.



HERE'S HOW E. W. BLISS COMPANY mounts the flywheel of their No. 33 press on Timken bearings, for extra load-carrying capacity and long, trouble-free bearing life.



GREATER LOAD AREA

Because the load is carried on the line of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

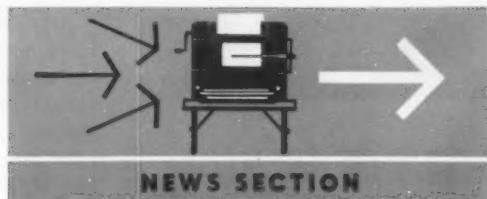
Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. Timken fine alloy steels.



TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION





How To Keep Your Operating Team in Trim

Front line supervisors need special treatment . . . Trend is toward more responsibility, less regimentation . . . Managers are also caught in pay squeeze . . . Merit reviews are successful—By G. J. McManus.

♦ INDUSTRY IS taking a long new look at its middle management and first line supervisory personnel.

And it's probably overdue. With new emphasis on product development, market analysis, sales forecasting, and other specialized functions, more and more management responsibility is falling within a poorly defined area between executive and foreman levels.

How to build a solid management group with defined responsibilities, and make it operate efficiently and effectively, is an important problem for any business. It's getting serious attention.

Expensive Programs

General Electric has put more than \$2 million into a management development school. Electric Storage Battery Co. has what it calls a management inventory program. Others are operating similar programs, hiring industrial relations experts, calling in outside consultants.

But at the same time, many companies have overlooked managers in their concern over relations with organized labor, work methods, and technical progress. New studies are showing up serious inequities in management structure, revealing misconceptions of middle management behavior.

Develop Individual

Merle C. Hale, director of salaried personnel activity at General Motors, points out that management people perform best "when they are given the maximum opportunity to exercise their individual capabilities and are subject to a minimum amount of group treatment or regimentation."

Special Treatment

Management jobs attract people who want individual treatment, he says. Management work makes special demands on individual qualifications. Methods and quality cannot be prescribed and controlled as in purely physical work.

Other authorities agree: The supervisor, at any level, should be as much like the head of a small business as possible, with his budget to meet, personnel problems to handle, some responsibility for production and quality.

But there is a problem. Most

management jobs today are being pegged according to a definite list of duties. Salaries are tied rigidly to job slots. Jobs are tied to orderly organization charts.

This may be necessary, particularly to avoid inequities. Dale Purvis, of Edwin, N. Hay & Associates, points to the case of a company that has just gone into job evaluation at the management level. Plotting salaries against function values showed nearly all key men underpaid. But a number of men who were being "carried" were up near the top of the pay scale.

To avoid this kind of thing, most companies are going into job evaluation at management levels.



PROFESSIONAL business management class in GE's General Engineering Laboratory is an example of decentralized manager development program. More emphasis is being placed on developing middle management team.

Duties are spelled out and jobs are placed in pay grades. This trend is going into high level corporate organization charts.

Merit Review

To keep managers happy with their jobs and satisfied with their progress or company status, most companies are using some form of regular merit review. At Brown Instrument Div. of Minneapolis-Honeywell, every classified manager sits down with his immediate superior twice a year to be told where he stands and why. Elsewhere, merit reviews generally take place once a year, with a personal interview and a written record of the rating.

Weight given to merit reviews varies with different companies. At Brown Instrument Co., all advancement at the manager level is on the basis of merit. At Industrial Resistance Corp., Philadelphia, the man advances to the middle of his pay grade on a semi-automatic basis. Further advancement in pay or job depends on merit.

At Electric Storage Battery Co.'s Exide Industrial Div. (see cover) equal weight is given to three factors: merit, psychological profile, and multiple interviews. This is a personal evaluation by supervisors at three higher levels.

All agree that pay and job structures must allow you to reward the manager according to his individual performance. But this is not as simple as it sounds. For example, the engineering shortage keeps engineering pay scales climbing skyward. Result is that beginning engineers often get paid salaries comparable to those of men with management experience and responsibility.

Biggest problem of relating pay to performance arises with men in the upper middle management bracket. Foreman pay ranges, say, from \$4600 to \$10,000, middle management from \$7000 to \$14,900.

Pay a Problem

The overlap indicates foremen are pushing middle management paywise. What has happened is that labor pay has risen much more sharply, moving with it the scale of first and second line foremen. The problem then becomes one of relating pay to responsibility, or at least reflecting responsibility within the company.

There is also the problem of managers wanting to spread their wings, utilize their abilities by taking responsibilities. This is the situation as stated by GM's Mr. Hale in stressing that management functions best when granted the most opportunity.

Current job trends generally enlarge the authority of managers. International Business Machines Corp. gives foremen (titled man-

agers) the main say in hiring and advancing men in their departments. Foremen at Industrial Resistance are responsible for quality as well as the quantity of production. Inspectors are regular members of production departments, reporting to foremen instead of a central quality control office.

Recognition a Must

Proponents of formal systems contend they are making sure the manager is given recognition for his performance. Administration of personnel functions has been placed in the hands of the line supervisor. The immediate superior makes a regular merit rating; the manager is evaluated by someone who has a personal knowledge and stake in his performance.

To equip managers for personnel functions, General Motors conducts group education sessions and on-the-job training programs. Industrial Resistance shows good results from asking supervisors to participate in setting up personnel programs. Managers were asked whether they wanted a merit review form; if so, what kind?

Apart from the essentials of pay, advancement, and responsibility, probably the most important element in management well-being is in communications. Some companies, like Industrial Resistance, go to unusual lengths in this direction. Lower echelons are notified when decisions are made and they are told what problems are undecided.

Same company makes sure individuals know where they stand. Communication upwards is also pushed. When a labor contract is up for negotiation, foremen are asked for their views on provisions.

All this takes time, effort and planning—and it's still difficult to stay ahead of rumors. But the company believes good communications are absolutely necessary.

Prestige symbols are always good for a few laughs. There is the case of the executive who smuggled an upholstered chair into his plant because he didn't want to be the only division manager sitting on bare wood.

To Insure a Good Operating Team**Give First Line Supervisors:**

Maximum opportunity to exercise individual abilities.

Minimum group treatment or regimentation.

Salary scales that reflect individual responsibility.

Regular merit reviews and management interviews.

Responsibility for production, quality, budgeting, department personnel.

Training programs to prepare for responsibility.

♦ NEARLY one-fourth of all steel shipments in record-breaking '55 went to the automotive industry.

An IRON AGE analysis of steel shipments by consuming industries, reported by American Iron and Steel Institute, reveals that auto companies took in 20.8 million tons of finished steel last year, or 24.6 pct of the 84.7 million tons shipped to all industry and export. The analysis includes shipments from producing mills, warehouses, and distributors.

Automotive consumption in '55 was more than 61 pct higher than a year earlier, and 26 pct above the previous record set in 1953.

Ranking second as a steel cus-

DISTRIBUTION

STEEL: Why '55 Was A Record

Automotive consumed nearly 25 pct . . . Construction, Maintenance second . . . Machinery, tools third . . . All but rails, aircraft, ships beat '53—By J. B. Delaney.

tomer was construction and maintenance, which consumed 15.6 million tons, or 18.4 pct of total shipments. This compared with 12.9 million tons in '54 and 14.2 million tons in '53.

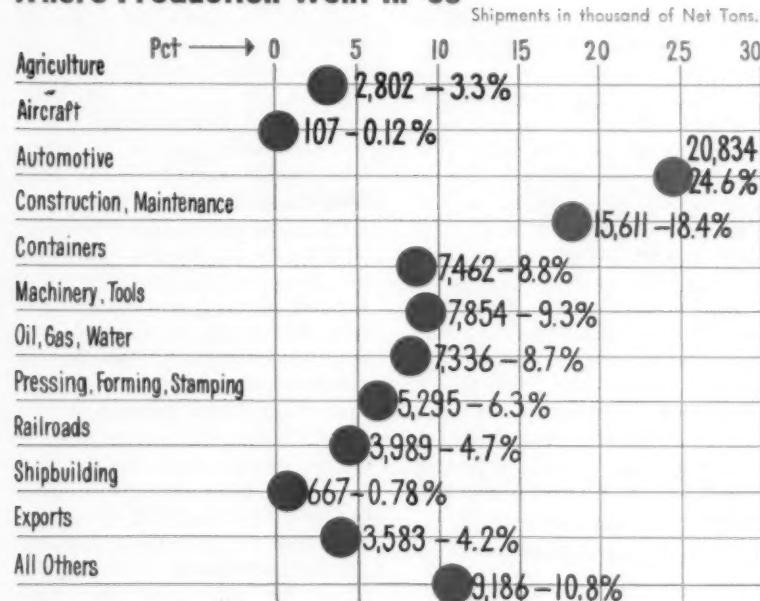
Machinery and tools took in 7.85 million tons, one-third more than in the previous year, but only slightly above the 7.3 million tons consumed in 1953. Fourth highest consumer was the container industry, with 7.46 million tons, 8.8 pct of the total and over a million tons more than the 6.4 million tons of 1954.

Oil, gas, water, and mining, as a group, consumed 7.3 million tons, or 8.7 pct, compared with 6.0 million tons, or 9.65 pct in 1954. But the 1955 total was just a shade higher than 1953's 7.2 million tons.

Consumption by pressing, forming, and stamping consumers totaled nearly 5.3 million tons, a 38 pct pickup over 1954's 3.8 million tons. Railroads consumed almost 4 million tons, or 4.7 pct of total shipments, as contrasted with 2.78 million tons in '54. However, the rails were a better steel customer in '53 when they took in 5.4 million tons.

Agriculture consumed 2.8 million tons, 3.3 pct of all shipments, compared with 2.4 million and 3.8 pct in 1954.

Where Production Went in '55



STEEL DISTRIBUTION BY CONSUMING INDUSTRIES

In Thousands of Net Tons

	1948		1949		1950		1951		1952		1953		1954		1955	
	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct
Agriculture	2,743	4.16	2,644	4.55	3,094	4.28	3,281	4.16	2,764	4.07	2,547	3.18	2,417	3.83	2,832	3.3
Aircraft	39	0.06	44	0.03	56	0.08	167	.21	163	0.23	189	0.23	97	.15	107	.12
Automotive	11,330	17.17	11,880	20.45	15,746	21.80	14,488	18.36	12,232	17.99	16,508	20.59	12,869	20.52	20,834	24.6
Construction and Maintenance	10,157	15.40	10,020	17.25	12,363	17.12	14,184	17.95	11,749	17.28	14,225	17.75	12,908	20.41	15,611	18.4
Containers	5,844	8.85	5,226	8.65	6,409	8.87	7,242	9.18	6,218	9.15	6,789	8.45	6,427	10.18	7,462	8.8
Machinery, Tools	5,337	8.09	4,274	7.36	5,812	8.05	7,133	8.92	6,131	9.02	7,307	9.12	5,829	9.19	7,854	9.3
Oil, Gas, Water, Mining	5,080	7.70	5,455	9.39	6,819	9.16	6,735	8.54	5,973	8.78	7,211	8.98	6,067	9.65	7,338	8.7
Pressing, Forming, Stamping	4,256	6.45	3,124	5.38	4,601	6.37	4,617	5.85	3,840	5.35	4,994	6.23	3,828	6.06	5,295	6.3
Railroads	5,866	8.89	4,638	6.95	4,786	6.64	6,558	8.32	4,575	6.73	5,454	6.80	2,793	4.40	3,869	4.7
Shipbuilding	716	1.09	722	1.24	355	.49	981	1.25	1,182	1.70	976	1.22	549	.87	667	.78
Exports	3,578	5.42	3,798	6.54	2,763	3.85	3,068	3.89	3,665	5.39	2,998	3.74	2,774	4.33	3,983	4.2
All Others	11,029	16.72	7,077	12.18	9,660	13.29	10,573	13.40	9,750	14.34	10,963	13.71	6,517	10.32	9,186	10.8
Total	65,073	100.00	58,104	100.00	72,233	100.00	78,929	100.00	68,004	100.00	83,152	100.00	63,153	100.00	84,717	100.0

IRON AGE compilation and distribution formula from data by American Iron and Steel Institute.

DIECASTING: Why All Graphs Point Up

Metalworkers continue to utilize more diecastings . . . Automotive and appliance industries continue to push trend . . . Zinc diecasting takes 40 pct of total slab metal . . . Job shops are biggest users.

- DIECASTING continues to grow in popularity among the nation's metalworkers. American Die Casting Institute reports that 1955 saw new all-time highs for both production and sales of diecastings.

Sales value of job shop produced diecastings hit \$457,500,000 last year, \$189,500,000 above 1954's \$268,000,000 and 40 pct above the previous record of \$319,000,000 set in 1953. These figures are based on the diecastings alone, do not include value of plating or other finishing or charges for dies and tooling. The Institute estimates that such sales and charges last year were well above \$250,000,000 for job shops alone.

Zinc Leads

Zinc continues to be the most popular diecasting metal, with 410,000 tons, or 40 pct of total slab zinc output, used by the industry last year. Zinc diecasting sales hit \$232,000,000 in 1955, although some of this figure is due

to boosted use of special high grade zinc, which for the first time displaced prime western as the most popular grade. And special high grade carried a premium of \$30 (now \$35) per ton for most of '55.

Diecasting consumed 385 million lb of aluminum, or over 9 pct of total aluminum production, for products with a total sales value of \$214,000,000. Of this record-breaking use of aluminum, 352 million lb went into aluminum diecastings, 33 million lb into zinc diecasting alloys. Here again, dollar figures are inflated due to metal costs. Over 75 pct of the aluminum bought by diecasters came from secondary smelters, accounting for about 55 pct of all secondary aluminum casting ingot sales. Lower priced primary aluminum sales rose only in the latter part of the year when aluminum stockpile requirements were reduced. Earlier availability of the additional aluminum would have made possible even higher diecasting use.

Magnesium diecastings showed substantial gains, with use of this light metal rising to 5,200,000 lb.

Where It Goes

Automotive and appliance buyers continued the diecasters' best friends in 1955, with automotive accounting for 59.6 pct of zinc poundage and 43.3 pct of aluminum. Home appliances took 18.5 pct of zinc and 18.7 pct of aluminum. Automotive markets also accounted for 37.5 pct of total poundage of magnesium castings, with the classification of industrial machines and tools and commercial equipment as the second largest consumer of magnesium diecastings at 34.6 pct. This latter category also was the third highest user of zinc and aluminum diecastings at 6.7 and 13.0 pct respectively. Third largest consumer of magnesium diecastings was national defense, at 10.6 pct or 550,000 lb.

The overall long-range trend picture is even more heartening to diecasters. The Institute plotted shipments to consuming industry groups (excluding national defense) for 1955 against the previous record years in each category, found that zinc diecastings rang up increases in 8 out of 11 consuming industry groups.

Aluminum's record has been even better, with a drop in only 1 of the 11 groups. In addition to automotive and appliance gains of 185 million lb, zinc diecasting use rose about 9 million lb in other categories. Aluminum diecasting use gained 71 million lb in automotive and appliance use and over 20 million lb for other uses.

Job shop diecasting shipments represent about 67 pct of zinc and 77 pct of aluminum diecasting.

Where Job Shop Die Castings Went in '55

(in pounds)

INDUSTRY GROUP	ZINC	ALUMINUM	MAGNESIUM
Agricultural Equipment, Mining, and Construction Machinery . . .	6,000,000	6,250,000	8,500
Automotive . . .	327,000,000	117,000,000	1,850,000
Other Transportation . . .	5,000,000	4,000,000	30,000
Industrial Machines and Tools; Commercial Equipment . . .	37,000,000	40,000,000	1,800,000
Electronics . . .	9,000,000	2,250,000	12,000
Office and Business Machines and Equipment . . .	11,500,000	12,500,000	320,000
Builders Hardware; Plumbing and Heating . . .	28,000,000	7,300,000	23,500
Photographic Equipment; Optical, Recording, Scientific and Measuring Devices . . .	11,000,000	14,500,000	85,000
Timing Devices and Clocks . . .	5,500,000	3,000,000	5,000
Home Appliances . . .	102,000,000	50,500,000	395,000
Toys; Jewelry; Personal and Sporting Goods . . .	6,500,000	5,700,000	23,000
National Defense . . .	3,500,000	7,000,000	550,000
Total . . .	550,000,000	278,000,000	5,200,000

Source: American Die Casting Institute.

SUB: Kickbacks Keep Labor Off Balance

Skilled workers in Detroit lead insurrection . . . Despite small chance of success, drive points up dissatisfaction . . . Seniority workers don't benefit from lay-off pay, want other measures.

♦ **SUPPLEMENTAL** Unemployment Benefit programs may turn out to be breeders of unrest among rank-and-file union members. What looked like a good thing last year is creating political problems for some union leaders.

The rebellion of skilled workers in the United Auto Workers against SUB and other contract provisions is worrying union leaders more than they care to admit. Members with long seniority—those likely to be last to lose out in a lay-off—also are inclined to take a dim view of contract provisions that are of nebulous value to them personally.

Want Today's Dollar

It all goes back to an old union truism that there's nothing like a buck in the pocket to buy the loyalty of the average worker.

That the current UAW skilled worker insurrection is virtually certain to get nowhere is beside the point. The significant thing is that it brings to the fore concrete evidence that some labor "gains" are not what they seem. The SUB unrest is behind hesitancy of some labor leaders to go out on the limb until they see which way the wind is blowing.

One group of UAW insurgents have banded together in the Society of Skilled Trades. It claims the right to act as bargaining agent for skilled workers at Burroughs Corp. plants in the Detroit area. The organization says it represents some 500 of the 700 skilled workers at Burroughs and would like a National Labor Relations Board election to prove it.

List of Beefs

The Society claims a membership of some 50,000 skilled workers in 7 counties in and around Detroit.

One of the Society's beefs is that skilled workers in the UAW are a minority and, as such, are ignored to the extent that they don't get enough money for the type of work they do.

They are particularly bitter about the controversial SUB plan adopted by the auto industry because, they claim, skilled workers are the last to be laid off in a plant and are least likely to benefit from any supplemental pay plan. What they want is more money now rather than a small amount put aside for a rainy day that may never come.

The Society also cites the fact that skilled workers in independent job shops always make more money.

The UAW contends that skilled workers in small shops make more money because they have less work

and thus less job security. In addition, it points out that skilled workers got a minimum of 8 cents more an hour than other UAW members in the latest negotiations. This, added to the regular 6 cent improvement factor, plus local adjustments in wage inequities, gives the average skilled worker a minimum raise of 14 cents an hour.

No Raiding

The fledgling group is out to get skilled workers out of the UAW. But it is handicapped almost from the start. Under ordinary circumstances, the NLRB forbids a union from raiding another union while a long-range contract is in effect. This being the case, the new organization will have to wait until 1958 before it can move in on the membership in the auto industry.

Steelworkers:

The Iron Age nettles USW leader over dissension.

At last week's "Operation Sound-off" meeting of the United Steel Workers in Chicago, David J. McDonald, union president, took THE IRON AGE to task for mentioning (see IRON AGE, March 8, 1956, p. 115) that there is dissension among USW leaders.

Said Mr. McDonald:

"THE IRON AGE recently remarked that there is some dissension. If there is any dissension, I want to know about it now."

There were no takers among union leaders present at the meeting, though one member, in an aside to a seatmate, registered a mild complaint over the union's in-

ability to organize all plants of a certain company, thus weakening labor's ability to make a strike hurt.

But what Mr. McDonald had in mind specifically concerned the rebellion of Joseph Molony, chief of the union's Buffalo district, against McDonald's hand-picking Howard Hague as the vice president to succeed the late James Thimmes. Mr. Molony put himself up as a candidate against Mr. Hague and lost. But the vote was surprisingly close in some districts, indicating stronger-than-expected sympathy with Mr. Molony's viewpoint.

Perhaps, as Mr. McDonald indicated, the storm has petered out. But if it hasn't, that's not necessarily bad. It just goes to prove the USW is not a one-man operation as some critics have claimed.

SHIPPERS: No Relief In Sight

Freight car program a whopper . . . But capacity trails high scrapping rate . . . Program handicapped by short steel supply . . . It's touch and go—By Tom Campbell.

♦ IF YOU EXPECT much relief in the freight car shortage, forget it. There isn't going to be any in the near future. Cars are being scrapped faster than they are being built. Specifically, cars will be built at the rate of about 4500 a month in the first quarter. They are being scrapped at the rate of 6000 per month.

If you read in the paper that freight car builders have a backlog of 145,000 cars (a prediction made months ago by THE IRON AGE) don't let that raise your hopes. That is the backlog all right, but it will take 2½ years to complete it even if no more orders were to be placed. Shops can produce only about 6000 cars a month even with March steel.

Freight Car Picture

CARS ON ORDER : 145,000

STEEL REQUIRED :

Structurals

Tons



Plates



Sheet-Strip



Other Products



Wheels-Axes-Castings



Total = 3,500,000 Tons



promised but did not get last year. Their allotment for the first two months of this year was wiped out. Result: in March they will get what they were supposed to get anyway and no more.

The Handicaps

The big drawback to capacity operations at freight car building plants is the steel shortage. Demand for plates is running heavier and is more confusing than at any time in recent years. It will get worse before it gets better.

The car program is running smack dab into a rising construction trend, plans for a "colossal" highway program, and one of the biggest industrial expansion programs in recent history. But that isn't all. The shortage of freight cars—now running to 4000 a day—has stepped up car rebuilding.

Railroads are frantically trying to rebuild cars which are so old they are literally falling apart at the seams. Many other cars have reached the point where nothing can be done; that's why the scrapping rate is so high. Demand for plates, sheets, and structural for rebuilding programs is running at fully 30 pct of the steel demand for new cars. And it will stay that way.

Defense Pressure

The increase in freight car loadings does not tell the whole story. Shipments are late, car shortages are serious, and the roads are losing more and more tonnage to truck, barge and boats.

Some steel customers feel that railroads are getting special treatment. At the same time car builders are insisting that they must get more steel if they are to meet the undisguised pressure from the Defense Dept. for more and better rolling stock.

It may be a little over two years before the present program is completed. A small amount of steel tonnage that the auto people had given up found its way to plates in some areas. But that is a temporary condition. The amount of plates turned up because of the "freed" auto steel you could put in your eye; or so it seemed.

Steel Needs

The magnitude of the freight car program can be grasped when translated into tons of steel ingots. The present backlog of 145,000 cars will require close to 5 million tons of steel ingots. Even if only half of the program is completed this year, that means about 2.4 million tons of steel ingots will go to new freight cars alone—and another 750,000 tons of ingots will go towards rebuilding "older" cars.

The freight car shortage and building program have come when everything else is hopping: it will be touch and go. The defense-conscious congressmen are in no mood to take excuses this time.

Considers Seaway Dock

Docking and storage structures to permit bulk handling of alumina shipments may be built on the St. Lawrence Seaway at Massena, N.Y., by the Aluminum Co. of America.

Alcoa is making engineering studies as a preliminary to its decision, reports Lewis G. Castle, Seaway administrator. The project under consideration includes a pier where ocean-going ships would dock, bulk and general cargo unloading gear, aluminum storage facilities, and connecting rail trackage. In addition, the study will see if it is feasible to use the waterway in bringing coke, pitch, and other materials into Massena while sending out aluminum and aluminum products.

BUSINESS

OFFICES: Plush Is The Word

Management will spend more to dress up offices in 1956 . . . Many items no longer luxuries . . . Metalworking to get big share of the market—By F. J. Starin.

◆ OFFICE workers will have more reason to hang a fancy tie on the traditional white collar in 1956. The word is that management is going in for flossier offices, with metalworking coming in for a big chunk of the market.

Office equipment spending will be up, says the National Office Management Assn., and a good part of this expenditure will be plunked on the barrel head for equipment and services heretofore generally considered luxuries.

Millions for Comfort

Here are a few of the ways management will spend its office equipment and furnishings dollar in 1956:

A water cooler that dispenses hot water for coffee, tea, and soups, as well as cold water.

Over \$136 million for new flooring and carpeting.

Soft lighting equipment. Manufacturers expect industry to part with \$100 million for new fixtures and systems.

Soundproofing and acoustical fixtures will make debuts in many offices at a cost of about \$55 million.

Even such things as odor control and posture chairs will come in for an increased share of management office spending.

Manufacturers of air conditioning equipment and the fancy water cooler-heater units look for office sales of about \$350 million.

Almost Half

No one seems to know what the total tab will come to. But a survey by NOMA indicates that 44 pct of its 16,000 members have already allocated substantial sums, including individual expenditures as high as \$10 million, for dressing up and equipping offices. About 3

pct of the companies answering the survey indicated that appropriations in excess of \$100,000 have been or are in process of being made.

Metalworking companies are expected to be among the most active in office equipment and machinery market—as supplier and customer. Metal desks and chairs, principally steel, are expected to cost management in excess of \$112 million. Wood counterparts, chiefly costly executive models, will account for about \$67 million. In addition, sales of metal filing cabinets and similar equipment are expected to total about \$133 million, and metal partitions and shelving about \$107.5 million.

Stock Items

Backbone of office machinery sales probably will be stock items such as dictating machines, tabulating and accounting machines and duplicating devices. However, tremendous interest has been shown in new developments, such as integrated data machinery.

The increased use of newer, more complex equipment is directly related to the added emphasis on luxury items. As systems become more complicated, trained personnel to run them becomes more scarce. To hold good office workers management must offer more.

Shows

To demonstrate new developments and techniques to management, NOMA will sponsor an exposition in conjunction with its national convention in Philadelphia, May 21 to 24. The Office Executives Assn. of New York will hold its annual National Business Show in the new New York Coliseum, Oct. 15 to 19, inclusive.

EXPORTS: The Competition Is Rough

Trade experts warn that top management must get on the ball to meet foreign competition . . . European recovery breeds aggressive push for world markets . . . German comeback hurts—By K. W. Bennett.

♦ U. S. EXPORTS can rise again in '56, but the export sales manager will need a full ammunition belt plus every weapon in the arsenal.

That's the general conclusion of 1000 U. S. businessmen who attended the World Trade Conference in Chicago recently. In addition, the trade experts point out, top industry management will have to supply the covering fire in backstopping the drive for future overseas markets.

While U. S. exports rose again in 1955, storm clouds are gathering. It may mean a leveling off in goods shipped overseas.

To help brighten the outlook, company management will have to give strong support to the sales force. A firm's export problems, it's pointed out, may begin with top management itself, not with the export sales chief.

Says Thomas Mabry, president of Engineering Equipment Co.: "You must fight the battle of the River Plate in Hamburg and in Milano."

A Sad Story

His case in point: an American plant executive who'd been marketing his product in post-war Germany. A German customer ordered one more unit, said this would be his last order since a German firm was preparing to manufacture a similar item and sell it for less.

The American felt any German sales he'd made were gravy. He'd retire from the market rather than shore up his export sales division for a trade battle in Germany. He counted on losing only the German business.

Three years later, copies of his equipment are being turned out

without license in three countries. While he retreated voluntarily from Germany, he's now being driven from much of Europe by low-price competition. And, recently, his once-secure accounts in Egypt and Argentina have been bagged by his new competitors who can compete with him in any foreign market he enters.

What's the solution? Construction of foreign plants is one. Licensing of foreign manufacturers is another. Buying into an existing local firm is a third. At least 700 U. S. firms, for instance, have invested in Australian plants.

German Comeback

Number one problem, say Conference delegates, is the current laxity on the part of many U. S. firms in meeting the flood tide of Japanese, British, and German competition.

German firms, for example, are already setting up manufacturing subsidiaries in Brazil. A prostrate nation 10 years ago, the Germans are an important factor in today's world trade picture, are already stepping on American toes.

Labor costs favor the Europeans. Whereas a European manufacturer pays an average 50¢ hourly wage, a U. S. producer pays \$2 per labor hour.

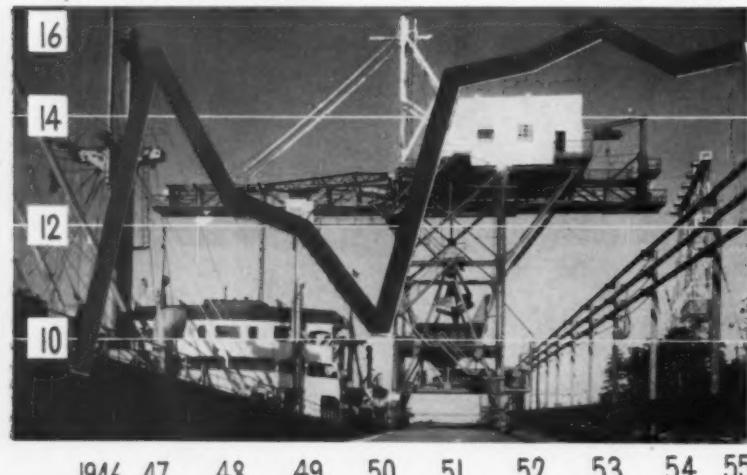
Manufacture Overseas

To meet the mounting challenge for foreign markets, a number of U. S. firms have set up manufacturing outlets in overseas trade areas, principally in the British Isles. The location is strategic. Currently, it's figured that about 50 pct of world commerce is handled in the Sterling area, of which Britain is the hub.

Are Exports Leveling Off?

U.S. Exports (in billions of dollars)

1955=Estimate



General Motors, Ford, General Electric, Westinghouse, International Harvester, and Monroe Calculating Machine are already well established in a number of foreign market areas.

A second problem facing U. S. firms, it's noted, is management's failure to strengthen overseas sales forces, and follow up with foreign inspection trips.

A third shortcoming: inadequate consumer research before pouring products into a foreign market area.

Take the case of a British firm shipping two models of a consumer item into South Africa. For the native trade, a cheaper version was shipped in quantity, along with lesser amounts of a higher priced item aimed at the white population.

Ray of Hope

The lower priced item cluttered dealers' shelves as the natives bought out the higher priced model. The ultimate cost of this misguess, say the experts, can be figured higher than that of an on-the-spot consumer research program.

A fourth big headache, but one in which a few glimmerings of light are at last breaking through, is financing long-term sales of heavy equipment.

British, Canadian, and German competitors have long had a field day in this sphere in recent years, with a seemingly unlimited amount of government backing for extension of long-term credit to prospective customers.

Paul Dietz, export department manager for Allis-Chalmers industries group, says: "Credit terms have proved to be a potent weapon out of Europe's formidable economic arsenal. It is in this area of durable goods that longer credits are traditionally most insistently sought by foreign buyers."

Export-Import Bank

Mr. Dietz points out that while total export sales have risen, U. S. machinery exports began declining in 1952.

Some hope of betterment in this

situation is seen, however. In 1954, the U. S. Export-Import Bank received fresh grants of authority and funds from Congress, moved rapidly at the start, then bogged down until late last year.

By the end of October, 1955, \$167.3 million had been authorized or allocated for credit for U. S. exporters.

Britain's well established export credit department is authorized to provide total commercial guarantees up to 750 million pounds Sterling, and actually insures about 15 pct of Britain's total trade.

Canada has a similar plan, while Germany guarantees export credit through two private companies having government backing.

Still another problem, say Conference attendants, is that management too often fails to study closely the foreign markets. It leaves forecasting and analysis entirely to the firm's field men.

Things To Do

In the trade fight that's shaping up for '56, that's not enough, experts point out. The company official who decides to take the

plunge, checks into market prospects overseas himself before going ahead.

He'll brief himself, for example, on the fact that in Japan, as with most Asian markets this year, dollar reserves are down, limiting buying. And that more and more, U. S. firms doing business in the area are operating through franchises. Complicating this picture, it's expected that the dollar reserve will continue to fall.

Good Markets

He'll ascertain, on the other hand, that New Zealand, which stepped up its trade with the U. S. in 1955, is still a good prospect for this year. Among 150 categories, machinery, chemicals, and some electronic equipment can be imported by buyers in that country without any special license. Conversely, Australia will have fewer dollars to exchange this year, and has her eye on Asian markets as well.

In this hemisphere, Chicago trade delegates figure that Chile may be a good prospect for heavier equipment buying since it's slated to go over to a free peso market around March 15.

Reds:

Soviet steps up buying of American farm machines

Russia, often boastful of her tractor and farm equipment production, is sharply stepping up purchases of American-made farm machinery. The Communist mother country is also increasing its orders for seed corn.

In the last two months, U. S. Commerce Dept. figures show orders for \$1.5 million worth of farm machinery and equipment and \$1.7 million worth of hybrid seed corn have been placed in this country by the Soviet Union. Part of the machinery will go to Rumania, but most is destined for Russia.

So far this year, our government has licensed about \$1 million worth of shipments of farm equipment to the two countries.

The Reds are buying tractors, lanterns, plows, cultivators, hay balers, garden tractors, and a pick-up truck for use by an American mechanic who will go along to service the machinery for a while.

Farm machinery is considered "peaceful goods," and although all shipments must be licensed, there is no other restriction on its shipment now.

U. S. government experts say the new flood of Russian orders for farm goods stems directly from the visit to this country last fall of Russian farm experts.

Applications for licenses together with shipments approved for farm goods and seed total \$3.2 million in the last six weeks, compared with only \$1.6 million worth of licenses granted in the final quarter of 1955.

ATOMS: Private Industry Needs Help

Private developers of nuclear power face tough problems . . . Getting insurance major headache . . . Legislation may put government in insuring role . . . Government ownership not impossible—By N. R. Regeimbal.

♦ YOUTHFUL PRIVATE atomic industry is in need of some government help, or it may die in infancy. Result of such a premature demise will be government ownership of all nuclear facilities.

Primary problem confronting private firms attempting to crack the nuclear energy business is insurance. But they also complain that the Atomic Energy Commission still isn't giving out its information fast enough, and in many cases not in complete form. And they lament the small number of government research programs into peaceful uses of the atom.

Nine Planned

At present, there are nine nuclear power plants planned by private industry, four with government aid and five entirely with private funds. Unless some system of insuring these potentially dangerous reactors is developed, only one will probably ever go into operation—the Duquesne Light Co. facility at Shippingport, Pa.,

which is insured by the government.

Problem is that while private insurance firms are willing to underwrite up to \$50 million or \$60 million of the risk of each reactor, there is a remote—but present—danger that a runaway reactor could cause damage running into billions of dollars. Industry wants the government to insure this catastrophic risk element, for a fee, to protect both the firms contemplating reactors and the general public.

Similarly, the insurance problem applies to firms which might want to set up a small reactor on their own to test the possibility of a nuclear powered locomotive, automobile, blast furnace, surface ship, or anything else requiring a source of energy.

May Be Solved

Argument is that if the private atomic industry breaks down, the government will step in and, because the government insures

itself, wind up insuring the research reactors anyway, plus footing the bills for building and running them.

There is a good chance that the insurance problem will be solved this year. The Senate-House Committee on Atomic Energy, after a week of testimony on the future of peaceful uses of the atom, and a seminar on the insurance problem particularly, indicates it is leaning toward a government program to cover the unknown super-risks of atomic reactors until there is enough experience built up for private insurance companies to be able to compute their risks and take over the job.

But industry will probably have to pay a fee if such insurance is voted, although it will be small. Some industry witnesses say a reasonable fee for such insurance would hardly cover the cost of collecting it.

Industry is finding it an expensive and difficult task getting started in the atomic business. Much of the equipment needed has to be specially ordered. The firms selling equipment or doing special research for the government also find that very often there is little or no profit in it.

Many firms are also running government atomic projects for nothing. But they figure the experiences gained, and the opportunity to build up a management and technical staff familiar with atomic research and development, will pay off in the long run.

Government operation of all nuclear facilities would not make everybody mad by a longshot. Spokesmen for the AFL-CIO and public power groups are actively urging Congress to take over the job of constructing reactors.

Atomic Power: Who's Building What?

ORGANIZATION	REACTOR TYPE	CAPACITY KW	ESTIMATED INVESTMENT BY ORGANIZATION (Millions)	IN OPERATION BY
Duquesne Light Co.	Pressurized Water	100,000	\$15	1957
Consolidated Edison Co.	Pressurized Water	236,000	55*	1959 or 1960
Nuclear Power Group (7 Utility Cos.)	Boiling Water	180,000	45*	1960
Penn Power & Light Co.	Homogeneous	150,000	not stated*	1962
Power Reactor Dev. Corp. (18 Utility Cos.)	Fast Breeder	100,000	55	1960
Yankee Atomic Elec. Co.	Pressurized Water	134,000	33.4	1959 or 1960
Florida Group (3 Utility Cos.)	Not stated	200,000	50*	Not stated
Pacific Gas & Elec. Co.	Boiling Water	5,000	4.0*	1957
Consumers Public Power District, Nebraska	Sodium Graphite	75,000	not stated	1959
Total		1,180,000		

* Without government aid.

Advance Blast Test

Biggest atomic weapons test ever scheduled for the Eniwetok proving grounds in the Pacific is to begin in March or early April instead of about May 1, as originally planned.

Once underway, the experiments may last into June, with military and Atomic Energy Commission officials prepared to detonate a record number of H-bombs and A-bombs. For the first time, an H-bomb is to be dropped from a plane.

New Fire Control

Westinghouse Electric Corp. will begin deliveries this spring of the Aero-13 fire control system for Navy aircraft, under terms of a new \$22.7 million contract.

Enemy aircraft can be located and destroyed when visibility is zero through use of the Aero-13, an outgrowth of the earlier APQ-35 fire control system used by the Navy. It will be placed in the Douglas F4D Skyray fighter interceptor, a carrier-based jet.

The new weapons control system is contained in a cylinder installed as a unit in the nose of the plane. This installation saves space and weight and eases the task of maintaining the system.

Navy and Westinghouse have made flight tests of the performance of the Aero-13, and the Navy has experimented with the system under varying conditions of humidity, temperature, shock, and altitude. Results indicate the system meets high standards of reliability and performance.

"Talos" on Guard

Protection for American cities and air bases is to be strengthened by a new weapon in the U. S. missile lineup, the Talos, developed by the Navy.

Sites for launching this supersonic missile, a seaborne version of which is being installed on the cruiser Galveston, are being surveyed by the Air Force near Lockbourne Air Force Base, Columbus, O.; Bunker Hill AFB, Ind.; and Peoria, Ill. and Kirksville, Mo.

Continental Air Defense Command will be in charge of the Talos sites and operation.

Defense Dept. has guarded details about the new missile, but it is unofficially said to be powered by a ram-jet engine and to have greater range than the Army air defense weapon, the Nike. Effective range of the latter weapon is about 30 miles.

Iron Curtain:

British admit sending defense goods to Soviets.

British officials admit shipping copper and industrial machinery to Communist countries, but say the increased trade with the Reds conforms strictly to agreements worked out with this country.

Although issued in the form of a denial of violating any agreements in their stepped up trade with the Soviet bloc, the British statements actually confirm congressional criticism of this country's actions in agreeing to loosen trade embargoes.

British records show that licenses have been issued for shipment of nine horizontal boring machines—although none have yet been shipped—as well as large amounts of copper wire.

Congressional criticism has centered on the U. S. State and Commerce Depts. for agreeing to the

DEFENSE

loosening of the so-called international embargo because it permits Britain and other foreign countries to ship strategic goods behind the Iron Curtain. The U. S. list, although slightly eased at the same time, still prohibits shipments by U. S. manufacturers of most types of machine tools and strategic metals and materials.

Grant Tax Aid

Fast tax amortization for 49 new or expanded defense facilities costing \$112.2 million, including facilities for heavy steel plate and for steel castings, has been granted by the Office of Defense Mobilization.

The Colorado Fuel and Iron Corp., Claymont, Del., received permission to write off 50 pct of \$22,823,000 for heavy steel plate under the fast tax amortization program. The Ohio Steel Foundry Co., Lima, O., received permission to amortize 65 pct of the \$1,829,742 cost of facilities for steel castings.

Most of the certificates approved in the two weeks ending Feb. 8 are for railroad freight cars; electric power generating and transmission facilities, military aircraft, and petroleum processing facilities.

Aluminum Goes Big in "Tin Cans"

• THE NAVY is fighting top heavy characteristics of heavily armed U. S. destroyers with increasing use of aluminum in superstructure and gun mount construction.

At the Quincy, Mass., shipyard of Bethlehem Steel Co. Shipbuilding Div., several ships of a new class of destroyers—the DD 931 class—are being built almost entirely of aluminum above the deck level.

This includes superstructure, gun foundations and stacks. In addition, the new destroyers make extensive use of the light metal below decks. Kaiser Aluminum & Chemical Corp. has organized a

special section to serve the shipbuilding industry and to handle the firm's growing business.

Sheet, plate and extrusions are being welded, cut and fabricated at the Quincy yard. High strength weldable 5083 alloy is used in the upper aft gun foundation as are 5083 plate and extruded structural shapes.

Deck housings are constructed of 6061-T6 sheet and plate. In many cases the inside surfaces are porcelain enameled for ease of cleaning, added stiffness and decorative purposes. An anti-sweat compound is applied where condensation is apt to be heavy.

EXPANSION IN INDUSTRY

East and West:

Colorado Fuel and Iron to spend \$10 million more.

Colorado Fuel and Iron Corp. still has \$10 million to spend in order to complete its plant modernization and development program for the fiscal year ending June 30, 1956.

The money will be spent on properties in both the eastern and western divisions.

The entire program, begun last June, totaled \$23 million. \$13 million has already been spent.

Ingot capacity will be increased at Buffalo by about 120,000 tons and at Pueblo, Colo., by 200,000 tons. Modernization of rod mill at Buffalo is expected to double output.

Openhearth furnaces will be revamped and new press equipment will be installed in the flanging dept. at Claymont, Del., works. In addition, new plate fabricating equipment will be purchased for a

new building being constructed at Claymont.

A new building is also being constructed at the Palmer, Mass., plant. It will house equipment from Worcester, Mass., plant which is being closed because the buildings are considered too old for rehabilitation.

Million Tons:

Youngstown Sheet and Tube to expand ingot capacity.

Youngstown Sheet and Tube Co. will spend as much as \$250 million during the next three years for replacement and improvement, the end result of which is expected to be an increase in annual ingot capacity of 1 million tons.

Also included in the program are extensive improvements aimed at promoting sharp increase in steel finishing output. Primary objects of this goal are facilities in Chicago and Youngstown. Already under construction at In-

diana Harbor is a new electrolytic tin plate mill and a new seamless tube mill.

Increased ingot capacity is expected to result from acceleration of current program rather than anything new. Key here is the project of enlarging existing furnaces and acquiring additional materials handling equipment.

Current steelmaking capacity of Youngstown Sheet and Tube is 5.75 million tons.

Expansion Briefs

IBM World Trade Corp., New York; new 11-story building on United Nations Plaza.

Allegheny Ludlum Steel Corp., Dunkirk, N. Y., Works; new 2000 ton forging press to be housed in a new building.

General Refractories Co. of Canada; new plant at Smithville, Ontario.

Electric Auto-Lite Co., Bay City, Mich.; new equipment and plant alterations to permit production of stamped aluminum auto grills and trim; approximate cost \$500,000.

Alan Wood Steel Co., Penco Metal Products Div., Conshohocken, Pa.; new plant at Oaks, Pa.; cost \$2 million.

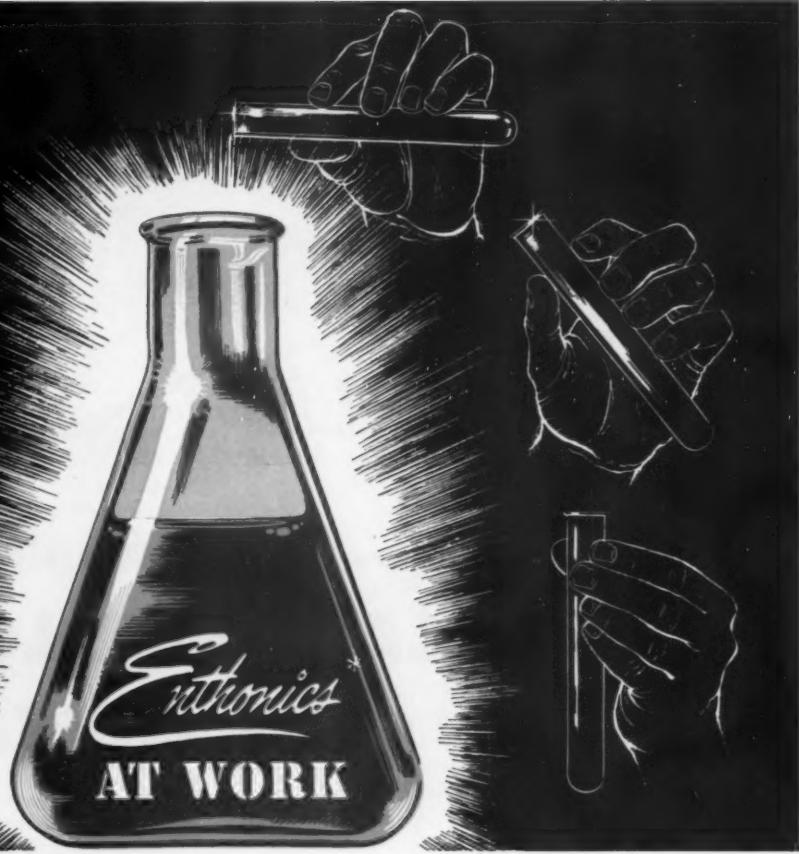
Peter A. Frasse and Co., Inc., New York; steel and aluminum distributor; new office and warehouse in Wethersfield, Conn.

Worthington Corp., Harrison, N. J.; new welding research laboratory.

Minnesota Rubber and Gasket Co., Minneapolis; new 32,000 sq ft addition to plant; cost \$500,000.



Helping Hands



FROM THOUSANDS of TESTS . . . *. . . come the solutions to your metal finishing problems.*

If you are looking for creative chemistry to supply new methods for the improvement of metal finishing, look to the leader — ENTHONIC. Write for the answers to these problems, identifying them by number. If your specific problem is not listed, Enthonic will gladly help to find the answer.

1. HOW TO BLACKEN copper, brass, zinc, steel and other metals to meet U.S. Government specifications.
2. HOW TO STRIP NICKEL from steel without etching the steel.
3. HOW TO STRIP NICKEL from copper and brass without attacking the part.
4. HOW TO SHED WATER from metals to prevent staining or spotting during drying.
5. HOW TO TRAP FUMES from hot sulfuric acid pickles.
6. HOW TO STRIP SYNTHETIC ENAMELS from aluminum and other metals without attacking the metal.
7. HOW TO CLEAN AND REMOVE RUST AND OXIDES from steel in one operation without acids.
8. HOW TO RINSE AND DRY STEEL WITHOUT RUSTING, using cold or hot water.

9. HOW TO SHORTEN ALKALI CLEANING TIME for steel to 15 seconds.
10. HOW TO REMOVE SOLID DIRT AND OIL from metals.
11. HOW TO STRIP LEAD, TIN or soft solder from copper and brass with no etching.
12. HOW TO PLATE METALS upon aluminum.
13. HOW TO REMOVE EXCESS SILVER SOLDER chemically from silver brazed steel parts.
14. HOW TO MAKE PAINT STICK to brass and zinc.
15. HOW TO SOLVENT-CLEAN parts and assemblies with cold non-hazardous solvent.
16. HOW TO OVERCOME CHROMIC ACID CONTAMINATION in cleaners.
17. HOW TO PREVENT STAINING of chromium plate.
18. HOW TO GIVE ZINC AND CADMIUM high salt spray resistance.
19. HOW TO COLOR ALUMINUM in one operation.
20. HOW TO STRIP METAL COATINGS from zinc die castings.

* The Scientific Solution of Metal Finishing Problems.

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442 ELM STREET, NEW HAVEN 11, CONNECTICUT
METAL FINISHING PROCESSES
ELECTROPLATING CHEMICALS

Service Representatives and Stock Points in Principal Cities of U.S.A. and Canada, Mexico, Brazil, England, France, Sweden and Germany.

March 15, 1956



READY NOW... first complete data on PLANT SITE LOCATIONS in New York State's SEAWAY LAND

For the first time, detailed plant site data is now available covering the Nation's newest and most promising industrial frontier—New York State's Seaway Land. Created by the St. Lawrence navigation and power projects . . . Seaway Land comprises an area that pulses with opportunity.

Within three years, completion of the Seaway navigation project will give to New York State's many Seaway ports—and the areas they serve—the ready and economical access to the world's raw materials and the world's markets. Trade routes to the seven seas will connect, in Seaway Land, with the great and smoothly efficient system of railroad, highway, air and inland waterway facilities already functioning in New York State.

The St. Lawrence power project now being built by the New York State Power Authority will be the largest hydroelectric power installation east of the Mississippi. Its power will start flowing in 1958. And the expansion of Niagara power in the near future will add more new power than that generated by the St. Lawrence. Add to these the constantly growing generating capacity of the private utilities, and Seaway Land becomes the nation's power center.

This, then, is the time to examine this area with an eye to your particular requirements. Our industrial location experts are prepared to recommend specific sites in Seaway Land to meet your manufacturing and marketing requirements.

Ready to serve you... NEW YORK STATE'S INDUSTRIAL LOCATION SERVICE

Our Industrial Location Service stands ready to give you the Seaway Land facts on which you can make a fully-informed selection of the right location for your individual plant.

The data we submit is gathered, organized and interpreted for your particular benefit by a staff of experts. It costs you nothing...a free service of the State of New York.

To get your free copy of our booklet—"Industrial Location Services"—write New York State Department of Commerce, Room 385, 112 State St., Albany 7, N. Y.

SUCCESS BEGETS SUCCESS



NEW YORK STATE

Averell Harriman
Governor

Edward T. Dickinson
Commissioner of Commerce

THE IRON AGE

REPORT TO MANAGEMENT

Last Month's Bears Are This Month's Bulls

One by one, you have seen the so-called weak spots in the economy disappear. In housing, for example, it's now conceded that no slump will occur. In automotive, some expected slack did come about, but to a much smaller degree than feared by most.

And where slackening did occur, other industries which were unable to meet their own demands during the previous year stepped in with zest. The result is that nobody is bearish today.

Even the cautious banking circles are smugly predicting good business the rest of the year—now. While there has been a leveling off of industrial production and other "indicators," this leveling off is at all time record high points.

Is there an Inflationary Undertone?

Danger now, although it has hardly reached that stage, is from climbing costs of labor, materials, transportation and other costs of doing business or producing goods.

There is little indication of any willingness to absorb extra costs. In fact, despite good business and record corporate earnings, few businesses have enough profit margin on a given product or service to cut it further.

Another contributing factor in that direction is the tremendous flow of capital expenditures now under way from industry, public utilities, railroads, and government units. This indicates further tightening of the money market. The money market has eased recently, but the outlook indicates further strengthening.

The situation has not reached what might be called a "clear and present danger." But the implication is that it might be well to expect some economic brakes later on.

If it was not an election year, you probably could hear some sounds in that direction today.

Economic brakes are not popular in any particular group these days. Business, of course, hates things like credit curbs, is generally recognized as the biggest voice in opposition to economic controls.

But that didn't prove to be the case last year when the Administration played around with some moderate hard money tactics. Democrats made the biggest fuss in Congress. Among consumer groups it was generally felt that the "small" man was hit hardest. There is no longer any reason to believe there is a partisan distinction here, although motivation may be entirely different.

If You Are Dealing With Atoms—

There's a new ruling clarifying rights to inventions or discoveries made by a firm operating a nuclear reactor or using nuclear equipment under an Atomic Energy Commission license.

You retain all rights to any invention or development you make, if you are in that highly exclusive group of industries. But the government can claim title if a licensee has entered into a contract or subcontract to perform specific work or share the costs of some operation.

Can You Help in Aircraft Development?

Potential ability of private industry and research to solve problems in the aviation field will be probed by a new Air Force agency, the Technical Industrial Relations Div.

The agency will place special emphasis on contributions by companies which have not previously contracted with the Air Research and Development Command. It will make preliminary studies, promises to help reduce paperwork required in obtaining contracts.

INDUSTRIAL BRIEFS

Fertile Facilities . . . Allied Chemical & Dye Corp., Nitrogen Div., will place in operation at its Omaha Neb. plant, facilities for the production of additional nitrogen fertilizer solution. New installations will produce solutions of the ammonium nitrate and urea type, marketed under the trade names, Nitrana, Urana and Uran. Nitrogen solutions are used to produce fertilizers and for top and side dressing crops.

Sales and Service . . . Lifton, Inc., Oakland, Calif., and West Industrial Equipment, Inc., Norfolk, Va., have been appointed to sell and service fork trucks, straddle carriers and powered hand trucks produced by Industrial Truck Div. of Clark Equipment Co.

Top Flight . . . Electronic Specialty Co. has received orders in excess of $\frac{1}{2}$ million dollars in airborne electronic equipment for a new supersonic Convair F-102 Interceptor. Assigned the job of stopping enemy bombers before they reach American targets, the F-102 can reach into the stratosphere to pinpoint enemy aircraft in any kind of weather, day or night.

Field Trials . . . Roberts & Randolph Ultrasonics Co., Baltimore, Md., is offering ultrasonic testing services either by immersion method or field contact for parts which can not be conveniently moved to a laboratory.

Inside Plumbing . . . Thirty manufacturers of plumbing brass met in Cleveland to organize the Plumbing Brass Institute, an all-industry association. The Institute is a result of the merger of the Sanitary Brass Institute, The Tubular Brass Goods Institute, and Brass Gas Stop Institute.

Look-ahead Subsidiary . . . Union Carbide Development Co. has been formed as a new division of Union Carbide & Carbon Corp. Long-term corporate planning and evaluation of new business opportunities will be the key objectives of the new company.

Swap . . . Foote Mineral Co., Philadelphia, will issue 169,178 shares of Foote common stock in exchange for net assets and business of Electro Manganese Corp., Knoxville, Tenn. This is equivalent to a share-for-share exchange.

Small Talk . . . An overall marketing and distribution agreement to handle Epcast insulating resins has been made by the Permacel Tape Corp., New Brunswick, N. J., with Furane Plastics, Inc., Los Angeles. Principal demand is from the electronics industry since this type of resin insulation is especially suited to the growing requirements of miniaturization.

After 36 Years . . . The Granite City Steel Co. will tear down its "A" blast furnace which was built in 1920. The shell of a new and larger blast furnace is being fabricated on a platform 50 ft from "A" furnace to replace the old unit.

Little Wind . . . A large wind tunnel specially designed for generating low velocity "gusts" to simulate high altitude conditions, is being completed on the north campus of the University of Michigan, Ann Arbor. When not being used by the university it will be available to other universities, research institutions and aircraft companies.

GE Chalet . . . The General Electric Research Laboratory's new European office is now permanently located in Zurich, Switzerland.

Saludos Amigos . . . Koppers Co., Inc., Pittsburgh, has been awarded a contract for the design, engineering and supervision in construction of two openhearth furnaces in Spain. The units will be built at Aviles, Asturia, Spain, by the Empresa Nacional Siderurgica, S.A., a government operated company.

The Twain Meets . . . Foilone Products, Inc., a wholly owned subsidiary of National Research Corp., is now producing metallized plastics and will soon offer metallized paper. Recent research activity has indicated that many materials heretofore believed to be unsuited for metallizing can now be coated with a highly metallic finish.



"Not that wiper! It's these wipers that are disposable!"

Pushing Out . . . Ziv Steel & Wire Co. has erected an addition to its Detroit warehouse.

Newest idea in seamless tube production

Looking for improved methods
of tube and pipe making?

At Mannesmann-Meer is the one of our most recent firsts in mill design is the three-roll arrangement being put to work in stretch reducing mills or continuous mandrel mills. The principle gives smoother outside and inside wall surfaces and better wall tolerances.

But that's only half the story. Along with the three rolls per stand, basic changes in over-all mill design include a revolutionary new mill drive and extremely fast schedule change-over. If you'd like to bring this creative engineering approach to bear on your tube mill plans or problems, why not call on us today? Mannesmann-Meer Engineering & Construction Company, 900 Line Street, Easton, Penn.

M.44



MANNESMANN-MEER

World Specialists in High-Speed Tube Mill Machinery





AUTOMOTIVE ASSEMBLY LINE

Inside Story on Stock Car Race Results

Results of so-called official stock car races are misleading on face value . . . Modifications are permitted . . . Drivers are pro's . . . Automakers aren't enthusiastic, but competition forces entry—By T. L. Carry.

◆ CLAIMS and counterclaims have been pouring out of auto company advertising offices since the National Assn. of Stock Car Auto Racing completed its speed week festivities at Daytona Beach, Fla.

NASCAR holds these events every year and they have reached the point where the accompanying ballyhoo is so contradictory that it is amusing.

Disregarding for the moment the "records" that were set this year, the question arises as to just what a stock car is. Most people could answer the question easily by saying it's a car that a manufacturer has in stock, in short, he produces.

Modifications Permitted . . . But it isn't that easy. Closer inspection reveals that a standard production automobile differs from those used at Daytona Beach. NASCAR permits certain modifications to engines and other components that result in increasing the speed of an automobile.

In addition, entrants in the various events sometimes interpret the rules rather loosely. This is sometimes done to such an extent that it is necessary to run an event over again.

What it adds up to is an attempt to claim feats of power for a car which, although they are technically

correct, could not be obtained in a standard production model by the average driver.

Let's get specific. Chrysler, Dodge, the Plymouth Fury, Ford, etc., all set records. The amazing part about the whole thing is that these cars did precisely what is claimed. If you have been listening to the radio or watching TV lately, you couldn't help but notice.

Not for Amateurs . . . Be that as it may, there are several reasons why these same stock cars could not perform as well for the ordinary consumer.

In the first place, NASCAR in some cases allows a certain amount of overboring in an engine. This adds to displacement, horsepower and speed.

The cars are tuned until their performance is razor sharp. A man entering an event tunes his car until it performs even better than the textbook says it is supposed to.

Drivers who win are strictly professional. Given the same automobile under the same circumstances, the amateur doesn't stand much of a chance.

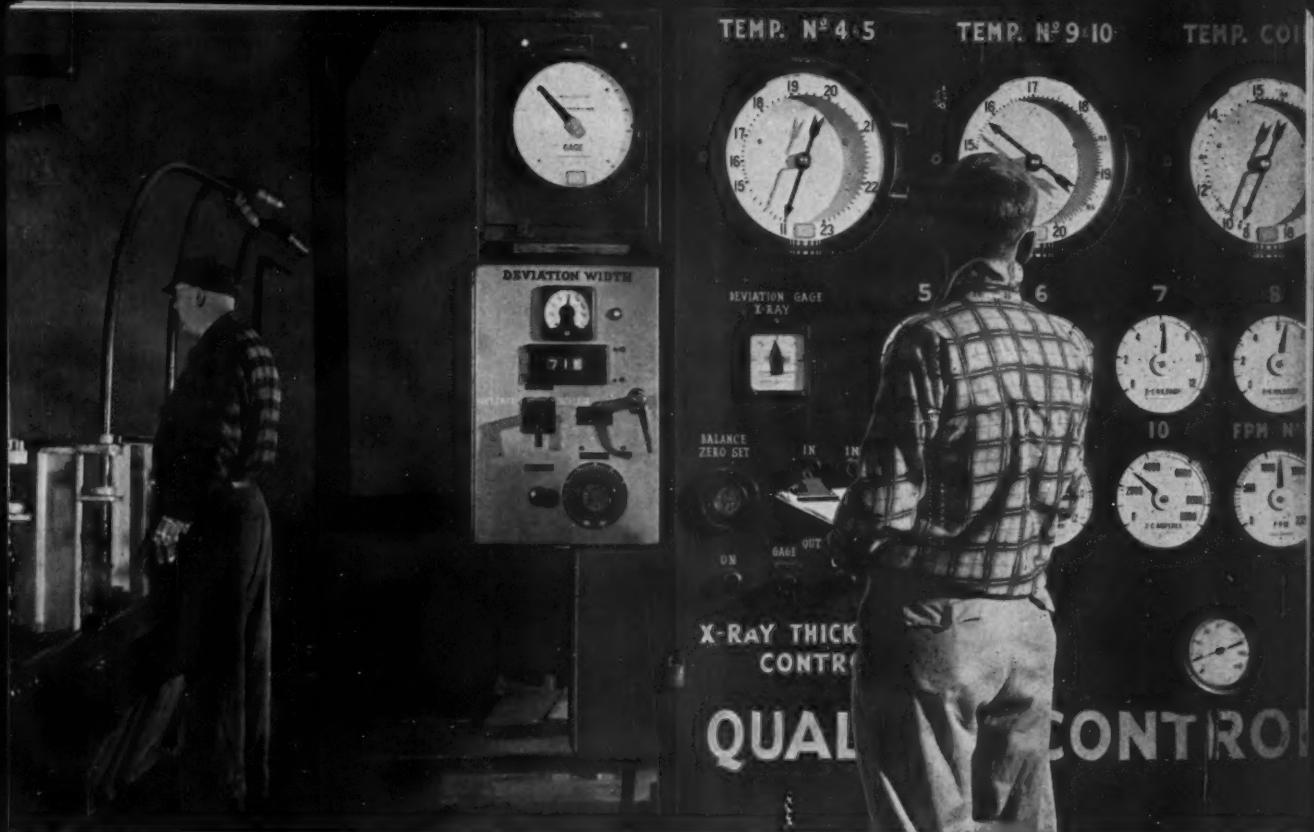
For example, the "flying mile" in the Chrysler 300 B class was won by Tim Flock, a professional driver, with an average speed of 139.373 mph. Brewster Shaw, who makes his living as a Chrysler dealer, drove the same type of car but averaged 126.805 mph. In eighth place, Wilbur Langham, of Antwerp, O., also driving a 300 B, averaged 117.321 mph.

Flexible Rules . . . There is also this matter of elasticity, or, if you will, misinterpretation of the rules.

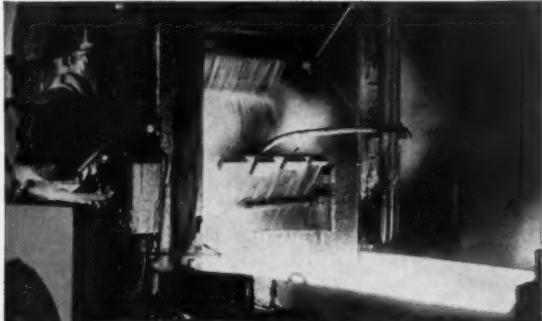
In one case, it was supposedly discovered this year that, if the fan belt on an engine was attached



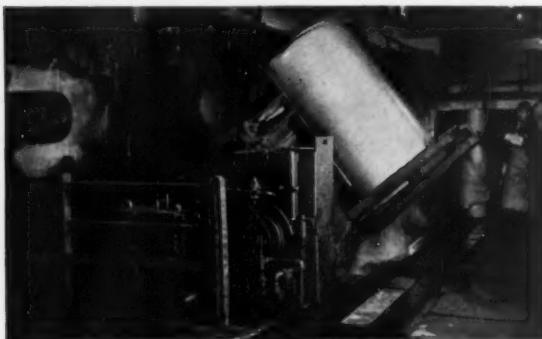
PASSENGER CARS have nothing on trucks these days in providing all the refinements and driver aids. GMC Coach & Truck Div. of GM offers in this "Blue Chip" series 4-speed Hydra-Matic transmission, road shock dampers, a new fast-ratio cruising axle in passenger car type styling.



How Great Lakes Steel *guides* quality



FIRST QUALITY CHECK is made at No. 1 Mill Stand. Here, an electronic pyrometer relays the strip's temperature to the panel.



FINAL CHECK in this operation is made at the coiler. From slab to coil, the control panel spells far better quality.

Here's one of several electronic operation panels that take the guesswork out of quality control at Great Lakes. You'll find this one guiding the entire operation of the 96-inch continuous mill.

As the red-hot strip races from roll stand to roll stand and on to the coiler, the temperature, speed, width and thickness of the strip *at each stage* are instantly shown on the panel.

A glance at the panel tells the operator if any adjustments are necessary to assure a finished product of the highest quality—a product that will stand the rigid test of your specifications.

This is further proof that Great Lakes has what it takes—the experience and the very latest equipment—to make your product even better. Our representative is just one telephone call away.

GREAT LAKES STEEL CORPORATION

Ecorse, Detroit 29, Michigan • A Unit of

NATIONAL STEEL CORPORATION

District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.

WHY ZINC RATES FIRST IN DIE CASTING • NUMBER 5 OF A SERIES



fine appearance as demanded by **SCHICK**
INCORPORATED

The brand-new Schick "25" electric shaver, commemorating Schick's Silver Jubilee, not only is claimed to be a completely new concept in electric shaving, but demonstrates the outstanding results of the latest techniques in precision product engineering. The "business end" of the palm-sized new "25" is composed essentially of the four ZINC die castings illustrated above. When chromium plated, these metal components contrast beautifully with the gleaming white plastic housing.

The ZINC die castings are shown as they are received by Schick from the die caster. Not only are all assembly elements accurately cast, but the design details (note the raised trade mark and the recessed lettering on the

nameplate) are sharply defined. *No machining is required* and, since the castings are ZINC, standard plating procedures are used. The right and left hand "whisk-its" (which snap open for easy cleaning) and the shearing head divider are bright chrome. The nameplate is finished in a soft silvery satin with the recessed lettering painted black to provide quick product identification.

Appearance is just one of many considerations which dictate the choice of ZINC die castings in product engineering. Send for our brochure and contact any commercial die caster for the answers to your particular production problems.



The New Jersey Zinc Company, 160 Front Street, New York 38, N. Y.

**The Research was done, the Alloys were developed, and most Die Castings are based on
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC**



Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
MARCH 10, 1956	140,542	27,413
MARCH 3 1956	140,774	26,648
MARCH 12, 1955	181,053	23,232
MARCH 5, 1955	176,180	16,712

*Estimated. Source: Ward's Reports

loosely, it "accidentally" fell off when the engine reached approximately 5000 rpm. Inspection revealed that more than one car had this trouble, which added about 10 hp to the engine.

In the light of this, it may be that producers regret being placed in the position where they are forced to enter the contests. But competition within the industry leaves the automakers with practically no other choice. They don't dare stay out if somebody else gets in.

Car Dealers:

GM policy may mean end to sales blitz.

The new agreement General Motors has set up for its dealer organization is serving two main purposes. First, it marks the start of a return to quality merchandising in the industry. Secondly, it gives GM a competitive advantage over others in the industry, namely Ford.

It is generally conceded in the industry that Ford was the originator of the super market or blitz selling technique for automobiles. This type of merchandising pays off in a short period of time. But it is becoming more apparent every day that in the long run it can have a detrimental effect. This is particularly so regarding a dealer organization.

Won't Push Dealers

GM has been smart enough to realize this and, through its new selling agreement, is admitting that dealers in some cases were suffering from it.

The closed telecast which Harlow H. Curtice, GM president, made to dealers last week was a detailed explanation of the new agreement.

Reports are that those who heard Mr. Curtice were favorably impressed with the new setup. The session was considered highly informative because it eliminated a lot of confusion that had previously been in existence.

The new agreement is uniquely arranged to put an end to bootlegging of new cars. GM is going to redetermine, where necessary, a dealer's selling potential. This means that a dealer is not going to get any more cars than GM feels he can sell.

About Face

This one point represents an almost complete about face in GM's thinking and here is how it will stop bootlegging.

Suppose a volume dealer is selling 1000 cars a month but his actual potential is only 600 cars. The redetermination will cut this excess off and it will be distributed to other parts of the country.

The corresponding reduction in freight charges will put this dealer on a competitive basis with bootleggers and it is believed that the practice will be pretty generally eliminated.

AUTOMOTIVE NEWS

Sports Styles Sell

Latest statistics released by the Automobile Manufacturers Assn. show that hard top and station wagon body styles set new records for popularity among new car buyers in 1955.

Hard tops accounted for 27 pct of factory sales last year compared to 17 pct in 1954. This makes the hard top the second most popular style in the industry. The 27 pct penetration amounted to 2,168,798 units.

Station wagons took 9.6 pct of factory sales compared to 6.3 pct in 1954.

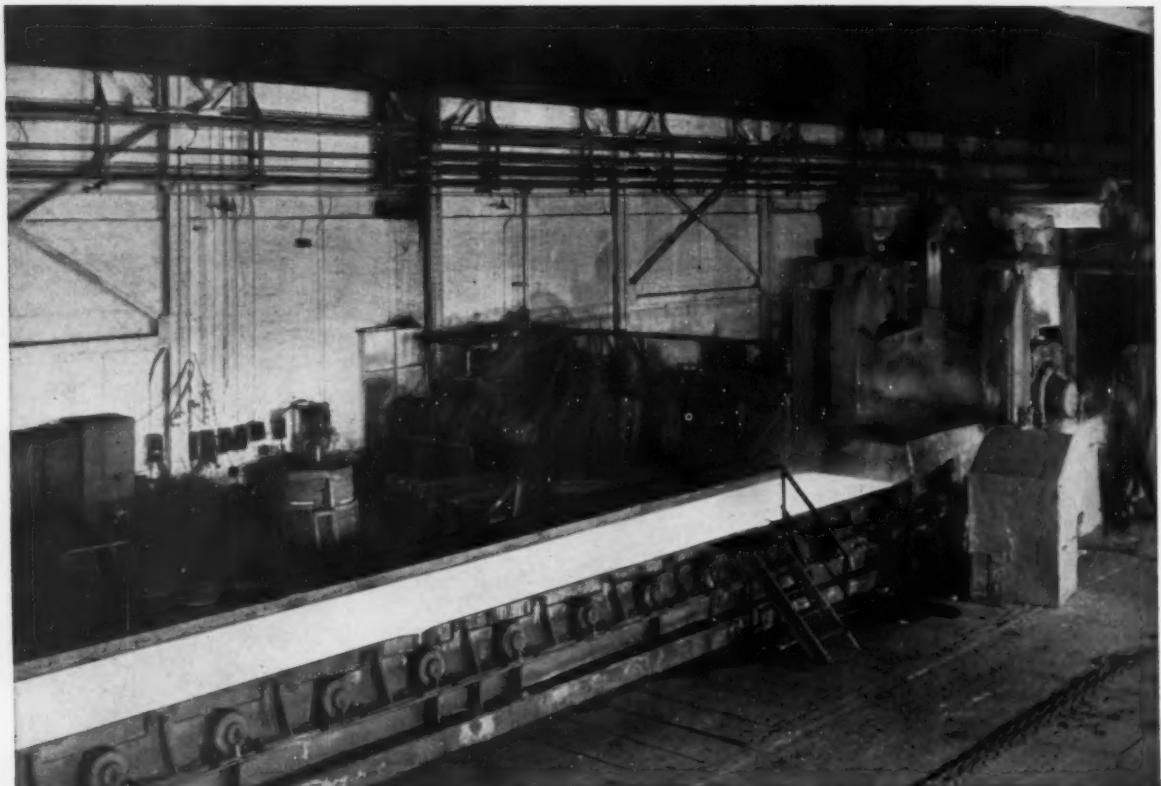
The record sales of hard tops was due largely to introduction of the 4-door style last year. This particular type alone accounted for 6.3 pct of sales.

The hard top's rise in the industry has been very swift. In 1950, when it was first introduced, it accounted for only 4 pct of sales. In 1955, it reached 14 pct and continued climbing.

THE BULL OF THE WOODS

By J. R. Williams





Gears & Bearings: Extra protection for

The enclosed gears that drive your rolls will run more smoothly, last longer and cost less for maintenance when lubricated with *Texaco Meropa Lubricant*. Ask the mill that uses it.

Texaco Meropa Lubricant contains polar additives that give it ability to cling to metal under the most adverse conditions. This, combined with long-lasting EP properties, enables *Texaco Meropa Lubricant* to give extra protection—far in excess of normal requirements.

In addition, *Texaco Meropa Lubricant* resists the thickening that is normal with many lubricants. It does not foam, will not separate, will not corrode gears or bearings.

A Texaco Lubrication Engineer will gladly give you full information. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street,
New York 17, N. Y.



TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

TUNE IN: TEXACO STAR THEATER starring JIMMY DURANTE on TV Sat. nights. METROPOLITAN OPERA radio broadcasts Sat. afternoons.



Mass Missile Output to Start in '57

Mass production of long-range intercontinental missiles is slated for early next year . . . Gov't plans call for building of more prototypes, launching facilities . . . Foreign aid is long-range program—By G. H. Baker.

• MASS PRODUCTION of the deadly 1500-mile intercontinental ballistics missiles (ICBM) probably will get under way early next year, according to a new Army procurement timetable.

Some recent big strides in perfecting the working models of the 1500-mile (mid-range) missiles point the way to the letting of procurement contracts and subcontracts during the coming fiscal year. The long and complicated research and development program is over the hump.

Congress is being asked to vote \$25 million to build more prototypes, to develop control and navigating components, to build launching facilities, laboratories, and to improve instrumentation.

Watch Your Costs . . . Because the Pentagon has assigned highest priority to the missile program, the companies that sign procurement contracts and subcontracts will find themselves on a fast, high-cost schedule. Three-shift production will be required by the government. Both wage-hour employees and salaried employees will be requested to put in all the overtime possible.

If your firm gets a missile contract or subcontract, be sure to figure your costs on the high side. While the Pentagon says this is not a "crash program," it definitely is a souped-up, high-cost program. Specifications probably will be changed during the run of the contract, and this could be expensive.

There is more likely to be serious changes than not.

Foreign Aid Long-Range . . . Ike's foreign aid boss, John B. Hollister, says we've got to stop thinking of foreign aid as something "temporary." It's here to stay, he declares. The U. S. has a permanent "obligation" to keep shipping dollars and goods abroad as long as world conditions remain as they are.

This point of view is causing some gasps of amazement among both Democrats and Republicans within Congress. Maybe Hollister is right, they say, but how much "giveaway" can the U. S. afford?

Since World War II, the U. S. has handed out more than \$50 billion worth of goods, services, and outright cash. Up to now, the relief program has been on a year-to-year basis.

In the back of everybody's mind always has been the idea that the handouts would end when the rest of the world got "back on its feet." It therefore comes as something of a shock to Congress to learn that the rest of the world is never going to get "back on its feet."

Ike is asking Congress for \$5 billion in foreign aid funds for the new fiscal year. This is nearly double the \$2.7 billion he asked for—and got—in the current year.

Will Make Bids Known . . . Industry soon will be able to learn something about the \$15 billion worth of goods and services the Defense Dept. buys each year, and companies will be able to bid on more procurement contracts.

The Senate indicates it will soon

A Profile on the ICBM

While Army pushes development of its 1500-mile missile, Air Force Assigns top priority to 5000-mile Intercontinental ballistics missile.

Here are specifications for ICBM, contracts to be let soon:

Range: _____ 5000 mi.

Length: _____ More than 100 ft.

Weight: _____ More than 100,000 lb at launching.

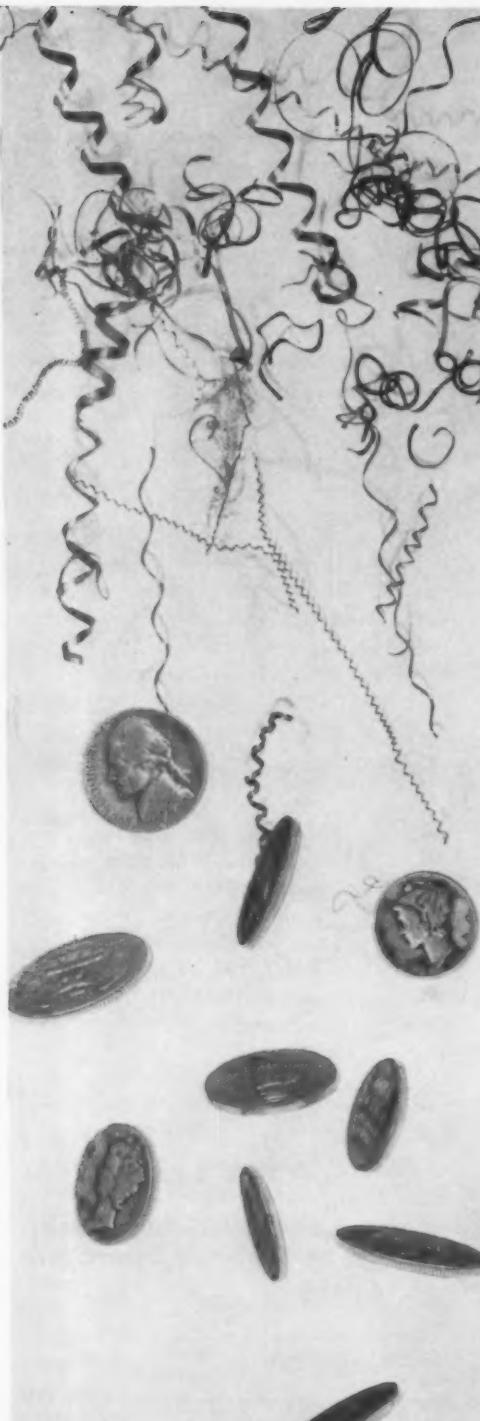
Speed: _____ 15,000 mph—23 times faster than sound.

Fuel: _____ Enough to last 4 minutes, momentum to destination.

Launching: _____ From ship, submarine or ground.

Accuracy: _____ Within 10 miles of target.

Force: _____ Will destroy 10 sq mi.



*making
stainless
steel?*

WASTE IS COSTLY!

Waste can mean a lot, especially if you have excessive conditioning costs or high rejection rate.

The addition of Vancoram Grainal Alloys has greatly improved hot-working characteristics of stainless and heat-resisting grades for many producers.

Think what that means—particularly in the higher alloy grades that are prone to develop cracks and other surface defects. Grinding, chipping and scarffing—the loss of good metal can be held to a minimum. You save in rejection and conditioning costs, which result in higher yield and the conservation of scarce alloying elements. And you step up production at the same time.

Why not try this new application of Vancoram Grainal Alloys. Your nearest Vanadium Corporation Sales Office will be glad to help you.



Producers of alloys, metals and chemicals

VANADIUM CORPORATION OF AMERICA

420 Lexington Avenue, New York 17, N.Y.
Pittsburgh • Chicago • Cleveland • Detroit



endorse a House-passed bill requiring the Defense Dept. to stop the existing practice of negotiating privately with firms supplying Army, Navy, and Air Force needs. Under the current arrangement, the military quietly picks the firms it wants to do business with, and the rest are out in the cold.

Congressional investigators calculate the Pentagon buys about 95 pct (dollar value) of all its goods and services through secret negotiation. Only the remaining 5 pct of its buying is advertised and bid upon by different firms.

There are two important exceptions in the new legislation:

1. A sizeable volume of procurement will still be carried on behind closed doors because of security requirements.

2. The Defense Dept. is authorized to channel contracts into "distress areas" (unemployment), regardless of the low bidder.

Excise Taxes:

New law can bring some relief.

Manufacturers who sell a portion of their production directly to retailers will get some excise tax benefits if Congress goes along with a new House Ways and Means subcommittee recommendation.

The subcommittee agrees to permit a firm which sells part of its goods to wholesalers and part directly to retailers to pay manufacturers' excise taxes on the basis of the price at which they sell to wholesalers. Industry had asked for the change in the tax laws because a manufacturer who sells directly to retailers and absorbs distribution costs pays a higher tax than he pays on sales through distributors where the price does not include distribution markups.

Hunt Wholesalers

A firm which now sells only to retailers, the subcommittee holds, can take advantage of the new law, if it is passed, simply by lining up wholesalers in one or two areas and thus establish a wholesale price on which to base its tax payment.

The subcommittee also urges Congress to write into law the rule now used by the Internal Revenue

Service under which IRS computes the selling price of sales by manufacturers to controlled distributing subsidiaries. Present law says IRS will compute selling price where a manufacturer does not sell through an "arms length transaction," and IRS has ruled that controlled subsidiaries is not at arms length. This decision would be written into law by the proposal.

The subcommittee also tentatively approves proposals to:

End the tax on refrigerator parts and components;

Ease the documentary stamp tax application to corporate mergers;

Exempt from the stamp tax any corporate action in which earned surplus is dedicated to a capital stock account.

Homebuilding Better

The outlook for house construction is a little better now than at the beginning of the year, President Eisenhower's top economic adviser believes.

Dr. Arthur F. Burns, chairman of the President's Council of Economic Advisers, tells Congress that no corrective legislation is needed now to keep homebuilding moving along. But he says the government is going to continue to watch closely the present shortage in mortgage money. They hope the situation "will correct itself."

WASHINGTON NEWS

Dr. Burns warns, however, that the government "may want to reconsider its opinion (that no action is needed) in two or three months" if the winter homebuilding slump carries into the spring. This is considered unlikely.

Fast Tax Aid

Electric power generating facilities and railroad freight cars account for most of the 50 new certificates for fast tax amortization for projects costing \$464 million issued by the Office of Defense Mobilization in the two weeks ending Feb. 22.

Largest projects go to Southern California Edison Co., which receives permission to write off 65 pct of \$133.4 million worth of electric power generating facilities at Huntington Beach and Ventura, Calif., and the Unit Load Car Corp., Chicago, which receives permission to write off 85 pct of the \$37.5 million cost of railroad freight cars.

The A & M Tool & Die Co., Inc., Southbridge, Mass., receives permission to write off 70 pct of \$35,834 for ordnance work.

Scrap Export Controls: The Issues

AGAINST:

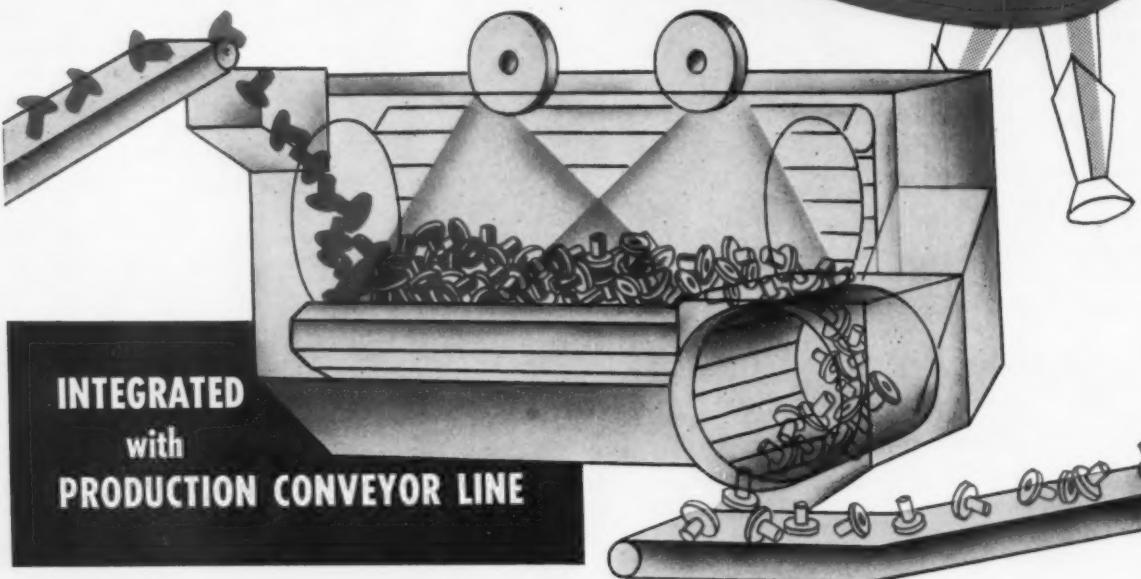
Assistant Secretary of Commerce H. C. McClellan contends there is no shortage of scrap for mills willing to pay the price. THE IRON AGE composite price is going down, indicating a decline in demand, he says, and government has no intention of reimposing controls unless there is a definite shortage or price is inflationary. (Prices actually have firmed recently.)

FOR:

Robert W. Wolcott, chairman of the board, Lukens Steel Co., argues that there is a shortage of high grade scrap, adds that from 60 to 75 pct of the record 5 million tons exported last year was primary grade. Charges that exports to Japan cost U. S. 6 to 7 pct steel production in early World War II.

WHEELABRATOR®

CONTINUOUS CLEANING AUTOMAT.



INTEGRATED
with
PRODUCTION CONVEYOR LINE

SPEEDS CLEANING, INCREASES PLANT CAPACITY, CUTS LABOR NEEDS FOR LARGE AUTOMOTIVE FOUNDRY

The goal of automation — maximum production without manual handling — has been achieved in the cleaning department of a large Detroit automotive foundry through use of a 48" Continuous Tumblast.

Processing of castings through this equipment is so automatic that the foundry process engineer reports, "We regard the Continuous Wheelabrator Tumblast as a part of our materials handling system — a conveyor integrated into our production line."

Gray iron castings cleaned in this automatic machine include transmission housings, cylinder heads, intake and exhaust manifolds, water pumps, bearing caps and differential cores. They come from the molding lines on a belt conveyor . . . are fed into the Tumblast automatically, are cleaned automatically and discharged automatically to sorting tables.

This has eliminated sorting and toting these castings to batch type machines, loading and unloading for cleaning, and toting in batches to sorting areas.

Cleaning an average of 8 to 10 tons of castings hourly, the Tumblast adds considerably to cleaning capacity of the plant and drastically reduces overall cleaning costs.

Write today for literature to learn how continuous blast cleaning can cut your production costs.

WHEELABRATOR
CORPORATION
(Formerly American Wheelabrator & Equipment Corp.)

510 S. Byrkit St., Mishawaka, Indiana

*World's Largest Builders of
Airless Blast Equipment*



Construction Boom Means New Markets

West Coast industry plans mean growing markets for metalworking products and services . . . Upcoming construction projects blanket coastal area, extend far inland . . . 1956 will be record building year—By R. R. Kay.

• ARE YOU SELLING the construction industry? Are you getting ready to cash in on the Far-west's construction bonanza?

This year will be the biggest ever for home, office, commercial, industrial, school, and freeway building, all big metal-using projects. One major fabricating company's backlog is 50 pct higher than a year ago.

There's no nervousness or uncertainty about the business outlook here. Take a hard look at what's perking. Sharp-eyed metal-working executives throughout the U. S. won't need prodding to get their products, equipment, and services into the act.

Here's An Up-To-The-Minute Rundown:

Denver: Two multi-million-dollar guided missiles and aircraft products plants are ready to go. Will bring in 22,000 new residents. Area will need some 13,000 new homes for plant workers and those in supporting industries. Voters recently OK'd a \$7.8 million school bond issue.

San Francisco: Engineering studies show a \$327.5 million cost for the proposed bent tube-and-trestle southern crossing of San Francisco Bay. Completion date 1961. Pacific Gas & Electric Co. will spend \$130 million this year to construct gas pipelines, electric and steam power plants. Plans are afoot for a \$14-million, 200-acre wholesale food center.

And the Bay Area may get a 123-mile network of high-speed electric trains to cost a walloping \$716.5 million. Lockheed Aircraft

Corp. is now working on two laboratories, part of a \$22 million layout for its missile division.

Phoenix, Ariz.: Sperry Rand Corp. and Motorola will put up big plants here. A \$25-million steam-electric plant is now going up. It will take three years to finish. The FHA has approved \$8.5 million for 795-home project at Luke Field Air Base. Also planned: a multi-million-dollar 100-store shopping center and a 400-room hotel.

Salt Lake City: Marquardt Aircraft Co. will build a ramjet engine test plant near here and a production facility at Ogden, Utah. Utah Power and Light Co. will put \$15 million into a 100,000-kw steam-electric generating plant.

Los Angeles: International Business Machines Corp. plans a 13-story (limit height) office building and data processing center, part of

a \$50 million program for bigger West Coast operations. A 13-story construction industry center will cost \$5 million. \$15 million is going into Douglas Aircraft's 1.1 million sq ft DC-8 jet assembly plant at Long Beach.

Southern California Edison Co.'s 1956-57 construction layout will top \$250 million: steam generating facilities, \$88 million; electric distribution equipment, \$80 million; hydroelectric plants, \$40 million; electric transmission lines and substations, \$33 million; other additions, \$11 million.

Bakersfield, Calif.: 1000 homes, a shopping center, park and recreational facilities will go up here. The \$20 million project is near the \$9 million college now being built.

British Columbia: Has largest single power program in B. C. Electric Co.'s 59-year history. A \$50 million hydro- and thermal-electric project for southern B. C. will add over 450,000 hp to the area's electric supply.

Seattle: Boeing Airplane Co. has a \$30 million building program going. Other privately-financed projects: two business developments totaling over \$60 million.

Wyoming: A cool \$100 million is earmarked for 1956 expansion by Mountain States Telephone & Telegraph Co. And Pacific Power and Light Co. will shell out \$25 million, part of it for a power plant near Glenrock.

Colorado: \$11 million coal carbonization plant and \$10 million fertilizer plant are coming to Walsenburg. And at Fort Collins, Colorado A. & M. College will spend \$10 million in the next 3 years.



"A couple of kids broke it earlier today!"

New Kearney & Trecker's "Bull's-Eye" Control Grouping

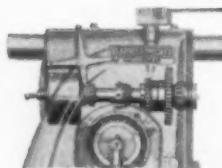


A few of many reasons why **TF** Series milling machines are so easy to operate



Heavier, Wider, One-Piece Knee — The TWIN SCREW arrangement supports the heavier, larger knee. Span and length of ways is increased considerably, providing fuller saddle support . . . lasting accuracy . . . substantial reduction of way and gib wear.

Twin Screw Knee Support — Exclusive double-support arrangement most effectively distributes weight of new machines' much wider, heavier knee, saddle and table. Balanced design substantially increases stability under heaviest loads . . . offers greater resistance to torsional thrust under all cuts . . . halves the wear factor, assuring greater, longer-lasting accuracy.



Three-Bearing Spindle — Complete assembly consists of three heavy-duty bearings, flywheel, a train of wide-faced forged steel gears. Rigidity of spindle unit contributes to increased cutter life . . . excellent finish . . . quieter and vibrationless operation.

TF Series milling machine's controls are conveniently grouped up-front where they belong to assure accurate settings . . . measurably reduce operator fatigue

ONE look tells why the new TF Series milling machines — Plain, Universal and Vertical — are so easy to operate. "Bull's-eye" up-front control grouping permits operators to achieve exact settings faster, more adeptly and with greater ease than ever before. This "Front-Trol" convenience is the key to low-cost production . . . because it increases the operator's efficiency and measurably reduces fatigue through elimination of wasted steps.

The "bull's-eye" knee and saddle-mounted controls are safety-interlocked and include feed selection, directional Mono-Lever table feed and rapid traverse, automatic cycle table feed and rapid traverse controls, front-mounted table handwheel, saddle clamping gib and backlash eliminator and hand and power directional controls for knee and saddle movements.

In addition, the new TF's give you a superior combination of outstanding design and operating features never before available on any other knee-type milling machines. They're built in five sizes — No. 2 to No. 6 from 10hp to 50hp.

Why take less than the latest when you want new milling machines? You can get all the facts on new TF Series machines from your Kearney & Trecker representative — call him or mail coupon direct to factory today.



Massive Column — Solid back, double-box section column is scientifically ribbed throughout to rigidly withstand heaviest cutting forces. Full bearing column face affords maximum support for the knee. Cross-mounted motor assures maximum ventilation, easy access for routine maintenance.



KEARNEY & TRECKER CORP.
6792 W. National Avenue, Milwaukee 14, Wisconsin
Please send me Catalog No. TF-50 with details on new line of TF Series Plain, Universal and Vertical milling machines.
Name.....

Title.....
Company.....

Address.....

City..... Zone..... State.....

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BUILDERS OF PRECISION AND PRODUCTION
MACHINE TOOLS SINCE 1898



MACHINE TOOL HIGH SPOTS

Next Decade Tells in Automation Race

American industry, prompted by streamlined sales techniques, will make up its own mind . . . Russian industry will get a large dose, like it or not, says visitor to USSR—By E. J. Egan Jr.

• THE AUTOMATION race between the U. S. and the Soviet Union promises to be most interesting. Over the next 10 years, streamlined American advertising and selling techniques will bear down harder than ever in an attempt to convince metalworking management of automation's advantages.

There'll be no lack of opportunity for U. S. businessmen to go along with automation. But they have the inalienable right to turn it down for any reason they deem sufficient—or for no reason at all.

Not So In Russia . . . Over the next decade all signs point to Soviet industry getting a full dose of automation shoved down its collective throat. The patient's ability to pay for the production "cure" doesn't seem to be any part of the picture. If the automation treatment is considered good for a sick output situation, forced feeding will be resorted to.

Big push behind the Russian drive to automate will come from a Moscow organization called ENIMS. So says Nevin L. Bean, technical assistant to the general manager, Automatic Transmission Div., Ford Motor Co.

Mr. Bean is one of the three top-flight U. S. engineers who recently returned from a 16-day tour of Russian industrial plants. Impressions of all three men have been widely quoted since their return to this country. But Mr. Bean had some interesting additional slants to pass on to a recent meeting of the Detroit chapter, National Society of Professional Engineers.

Absolute Control . . . Bean explained that the ENIMS group is the Experimental Scientific Research Institute for Metal Cutting Machine Tools. It controls design of all machine tools in Russia, either by creating its own, or by a power of approval or rejection of plans submitted by various factories.

"It considers its major task to be to prevent industries from building new units that do not incorporate latest improvements, including automation," Bean said. The group plans four to five years ahead. In line with its current 10-year and 15-year plans, ENIMS expects to replace manual machinery with automated lines wherever possible throughout Russian industry. And they've made considerable progress already.

Straws in Wind . . . So much for the Soviet plan. Let's tag a few straws that appear to be in the wind for U. S. metalworking firms over the next 10 years. One is good salesmanship and another more convincing advertising, as already mentioned. And looming big enough to be almost a whole bale of straw is the pressure for cost reduction that competition in a free enterprise society promotes.

These forces, encouraging automation for maximum production and efficiency, will be highly educational. They'll be administered primarily in the revered American "College of Hard Knocks." But that's not all. It now appears that duly constituted colleges and universities will recognize automation academically.

Education . . . One hint comes from the announcement that Pennsylvania State University will conduct its second annual automation seminar this summer. In addition, the university's Industrial Engineering Dept. plans to work the subject into its undergraduate curriculum, and also intends to get a research and development program underway.

Massachusetts Institute of Technology and a few other technical schools are also working along these lines. As others join the ranks to teach that automation is more to be favored than feared, the U. S. could maintain, even increase, its lead in this field.

Penn State's seminar, from June 11-15, will be specifically directed toward solving the automation problems of small firms.



"How can I start the day right when the first two faces I see are yours and the foreman's?"



Patents Applied for

REVERE'S Revolutionary NEW Product— **IT'S SOLID!**

Offers NEW ECONOMIES

Tube-In-Strip comes to you in long coils or in sheets, as you wish. You fabricate it by stamping, bending or otherwise forming it, and then by simple inflation you expand the longitudinal integral internal channels into tubes, round, half-round, rectangular, hexagonal, fluted, as your design calls for. There is your finished product!

Remember, Tube-In-Strip is solid, not a sandwich, not two pieces welded, brazed or bonded together. It is a single piece of flat metal containing inflatable channels that are located and sized to your specifications.

These metals are now available: Copper, Brass, other Copper Alloys, Aluminum. In development: Stainless and Low Carbon Steel.

The web between the tubes conducts heat faster. Structural strength is high, so you can use lighter gauges, saving in weight and price.

Since the initial announcement of this radically new Revere Product intense interest has been displayed by American industry. The Revere Sales Offices, the Technical Advisory Service and the Research and Development Department will be glad to provide additional information, and collaborate with you in taking advantage of this extraordinary new material.

HERE'S WHAT TUBE-IN-STRIP MEANS TO YOU:

MORE economical to buy

MORE strength

MORE economical to work

MORE efficiency

REVERE
COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801
230 Park Avenue, New York 17, N. Y.

Mills: Baltimore, Md.; Brooklyn, N. Y.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Newport, Ark.; Rome, N. Y.
Sales Offices in Principal Cities, Distributors Everywhere.

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REFRIGERATION
Condensers
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Cold Walls

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Condensers
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HEAT EXCHANGERS
Process Industries
Chemical Industries
Petroleum Industry

INSTRUMENT LINES
WATER HEATERS AND COOLERS
Domestic
Commercial

RADIANT PANEL HEATING
BASEBOARD RADIATORS
Automotive
Car and Truck Radiators
Heating and Cooling Panels
Transmission Oil Coolers

AIRCRAFT
SOLAR HEATING
ELECTRICAL INDUSTRY
Oil Coolers
Gas and Fluid Heat Exchangers

AUTOMOTIVE
Control
Recording
Metering

FOOD PROCESSING
BEVERAGE INDUSTRIES
ARCHITECTURE AND BUILDING
Structural
Decorative
Functional

MANY, MANY OTHER APPLICATIONS IN EVERY INDUSTRY



The Iron Age

SALUTES

W. A. Meddick

A sound foundation of personal contacts and tireless energy make him a salesman's salesman. A specialist in materials handling equipment and what it can do, he's doing big things for industry.

Elwell-Parker's Hank Meddick is a sales executive of the old school. He operates best at close range, will often travel hundreds of miles rather than phone a customer and try to sell without personal contact.

Because if he can see a customer, Mr. Meddick can spot objections almost before they enter the man's mind. He can sense resistance and he has the guns to snuff it out in a hurry. Vice-president in charge of sales at Elwell-Parker, he's been talking, selling and designing materials handling equipment for over 20 years. In things like fork, platform and clamping trucks, he has seen the needs clearly. He has helped in designing the early models. He has been a leader in establishing industry standards. He has sparked industry-wide progress.

Mr. Meddick knows industrial trucks as few men do, but he carries the knowledge easily. He makes friends readily, has a ready wit and great numbers of stories about his early selling days. At trade conventions and other grueling business events, he operates without sleep, outlasts

younger men every time. He's the kind of a man company agents are always glad to see. They know he can nail down sales and stimulate activity on any call.

Mr. Meddick started in business 50 years ago. At 17, he joined American Steel and Wire Co. in Cleveland. He considers his work in warehousing there the start of his materials handling career. He moved deeper into handling with Lakewood Engineering Corp. in Cleveland. Working in cost accounting, he talked Lakewood's president into allowing him to sell one-half of each day. This start soon brought him into full-time sales work. Handling earth-hauling equipment, narrow gage track cars, mine equipment and the like, he began accumulating knowledge on industrial trucks.

In time, he became sales manager of the materials handling division of Lakewood. When the company sold out, he started his own business. In 1936, he joined Elwell-Parker and took up the sales post he still holds. He shows no sign of slowing down.

Ohio Rolls

shaping metal for all industry



Choose from 12 types of
Ohio Iron and Steel Rolls:

Carbon Steel Rolls

Chilled Iron Rolls

OhioJoy Rolls

Dense Iron Rolls

OhioJoy "K" Rolls

Nickel Grain Rolls

Flintoff Rolls

Special Iron Rolls

Holl-O-Cast Rolls

Nioley Rolls

Ohio Double-Pour Rolls

Forged Steel Rolls



THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO

Plants at Lima and Springfield, Ohio

PERSONNEL



EUGENE C. CLARKE, JR., elected president, Chambersburg Engineering Co., Chambersburg, Pa.



CHARLES L. HOLBERT, elected vice president, H. K. Porter Co., Inc., Pittsburgh.



HAROLD F. COLLINS, elected vice president, sales, Metals Disintegrating Co., Inc., Elizabeth, N. J.



ROBERT C. WAYNE, appointed sales manager, The Hamilton Foundry & Machine Co., Hamilton, O.

The Iron Age INTRODUCES

Alvin W. Keeshan, elected vice president and chief engineer, Modern Engraving and Machine Co., Hillside, N. J.

J. W. Anderson, elected vice president, The Union Chain and Manufacturing Co., Sandusky, O.

M. C. Irani, appointed vice president, research and development, Metals Chloride Div., Salem-Brosius, Inc., Pittsburgh.

Larry Gannes, appointed vice president, sales, Hancock Steel Co., Inc., Detroit; **Vernon A. Peters**, elected executive vice president.

Cramer W. LaPierre, elected executive vice president, General Electric Co., continuing his overall responsibility for the Electronic, Atomic and Defense Systems group.

John H. O'Neil, appointed counsel, Chemical and Metallurgical Div., General Electric Co., Pittsfield, Mass.

Charles R. Pritchard, elected vice president, General Electric Co., continuing as general manager, GE Supply Co. Div.

Carlton P. O'Brien, appointed executive accountant, Granite City Steel Co., Granite City, Ill.

William E. Dobbins, named central regional sales manager, Clark Bros. Co., Olean, New York.

Robert R. Warns, appointed supervisor, Los Angeles district office, Dexion Div., Acme Steel Co., Chicago.

Walter A. Graham, named technical advisor, industrial, Dallas Div., Chicago plant, Revere Copper and Brass Inc., New York.

A. C. Meixner, named sales manager, Transportation and Generator Div., Westinghouse Electric Corp., Pittsburgh.

John E. Barbier, appointed manager, engineering, Jones & Lamson Machine Co., Springfield, Vt.; **W. F. Couts**, named manager, Thread Tool Div.

Frank A. Small, named manager, Boston District sales office, Revere Copper and Brass Inc.

O. H. Davol, appointed manager, General Engineering Dept., Electro Metallurgical Co., Niagara Falls, N. Y.; **S. S. Blackmore**, named assistant manager, General Engineering Dept.; **H. M. Huse**, named consulting engineer, General Engineering Dept.

S. A. McFarland, Jr., appointed assistant manager, stainless steel sales, U. S. Steel Corp., Pittsburgh; **Ellwood H. Spencer**, appointed general traffic manager, U. S. Steel Supply Div., Chicago.

Elvan R. Babylon, named manager, engineering sales, Kaiser Steel Corp., Oakland, Calif.

PERSONNEL

**VOLUME makes
the GEARS
GO
'ROUND**



MASTER MECHANIC, THE CINCINNATI GEAR CO.

Do you know what a small spiral bevel gear generator costs at today's prices? Approximately \$35,000! And the cost of the work done by this machine represents on the average only about 15% of the total cost of producing a spiral bevel gear. Thus you can see it requires *volume* production and *maximum* utilization to make such expensive, specialized equipment pay off. And yet without such equipment, whether it be this spiral bevel gear generator or any one of the other pieces of capital equipment in our plant, it would be impossible to produce quality custom gears at a competitive price.

The sales and production departments have a big responsibility to keep these machines busy and earning their keep, but their efforts would be wasted if we didn't have the *right* tools in the first place. It is my job to see to it that we *have* these tools—that our plant is equipped with the most modern and efficient equipment available—through continuing re-evaluation of our present installations and constant searching for new and improved machines. When I can find equipment which would be superior to present equipment, I take the facts to top management. I've found in my 43 years' experience that in a progressive firm like ours these recommendations are usually acted on favorably—and promptly. That's how we manage to maintain a completely modern gear manufacturing plant, and thus produce progressively better gears more efficiently for you, our customer.

**THE CINCINNATI GEAR CO.
CINCINNATI 27, OHIO**

"Gears—Good Gears Only"



Frank J. Grumbach, appointed Cleveland district sales manager, Berger Div., Republic Steel Corp. This corrects an error in March 1 issue.

R. L. Jolly, appointed general manager, Wheeling and Steelcrete Factories, Wheeling Steel Corp., Wheeling, W. Va.; **Paul Brand**, appointed assistant superintendent, Production Dept., Steelcrete Factory, Beech Bottom, W. Va.; **Richard Glaser**, appointed assistant development engineer, Products Research Dept.; **Fred Grady**, appointed foreman, Building Maintenance; **Homer Henthorn**, appointed foreman, Lath and Accessories Dept.; **Raymond Lawson**, appointed superintendent, Electrical Dept.

Ves Hoffman, appointed district sales manager, St. Louis, Crown Cork & Seal Co., Baltimore, Md.

Robert J. Wicks, appointed sales manager, bar and tube products, Cincinnati div., The Solar Steel Corp., Sharonville, O.

Ray N. Griffin, appointed general manager, Bart Laboratories Div., Bart Manufacturing Corp., Belleville, N. J.; **William A. Hopkins**, appointed general manager, Bart Lectro-Clad Div.

Kenneth H. Carlson, appointed technical manager, aircraft materials, Latrobe Steel Co., Latrobe, Pa.

Myron W. Rhoten, named managing director, Allis-Chalmers Great Britain Ltd., Essendine, England.

James E. Diamond, appointed assistant to manager, Wheeling Corrugating Co., Philadelphia branch; **A. L. Zimmer**, appointed assistant sales manager, Buffalo branch; **W. K. Colhoun**, appointed assistant manager, New York branch.

Roy H. Heldenbrand, appointed divisional manager, Threadwell Tap & Die Co., Greenfield, Mass.



RAYMOND STEVENS, elected president, Arthur D. Little, Inc., Cambridge, Mass.



T. HERBERT HAMILTON, named general counsel and secretary, Blaw-Knox Co., Pittsburgh.



T. S. O'KONSKI, appointed general manager, factories, Wheeling Steel Corp., Wheeling, W. Va.



JOSEPH P. CROSBY, appointed director, Metalworking Equipment Div., BDSA, Dept. of Commerce.

GENERAL REFRactories



TAX\$. . . earned by brick

If you own securities . . . if you're paid a salary . . . if you earn commissions . . . no matter how you make your income, the starting point is brick. Refractory brick.

Refractories, the industry behind industry. Refractories that contain and control flame . . . the flame that produces metals, glass, paper, rubber, oil, cement, power, transportation. Everything that's made or moved requires them.

But those requirements vary . . . vary over a

vast range of applications. To provide them in almost infinite variety and enormous quantity, Grefco employs extensive research, maintains the world's most modern refractories laboratory, and supplies a Complete Refractories Service from strategically located plants, both here and abroad, that draw on the world for materials.

A Complete Refractories Service
GENERAL REFRactories COMPANY
Philadelphia 2

SEND FOR THE MOTION PICTURE: THE GREFCO STORY



It is a beautiful 16 mm. motion picture in full color and sound which relates the fascinating and little understood story about the refractories industry... *the industry behind industry*. Viewing time is 26 minutes. If you would like to show it to executive, employee, social, church or other groups, a request on your letterhead is all that is necessary. Address General Refractories, Philadelphia 2.

PERSONNEL

Frank J. Thomas, appointed superintendent, steel conservation and quality control, Republic Steel Corp., Cleveland.

John W. Ahlberg, named electrical superintendent, Pittsburgh & Conneaut Dock Co., U. S. Steel Corp., Conneaut, O.

Bruce W. Wilson, named sales supervisor, steel and tin mill accounts, Metal Processing Dept., Pennsylvania Salt Manufacturing Co., Philadelphia.

William J. McQuillan, appointed assistant transmission manager, Pittsburgh Gage & Supply Co., Pittsburgh.

Lloyd A. Amos, appointed works manager, Kaiser Aluminum & Chemical Corp., Ravenswood, W. Va.; A. F. Garcia, appointed works manager, reduction plant, Mead, Washington.

Joseph Piperata, named field engineer, Mannesmann-Meer Engineering and Construction Co., Easton, Pa.

Robert J. Yochum, appointed abrasive engineer, Bay State Abrasive Products Co., Westboro, Mass.

Milo L. Phillips, named sales engineer and technical consultant, Alloys & Chemicals Mfg. Co., Inc., Cleveland.

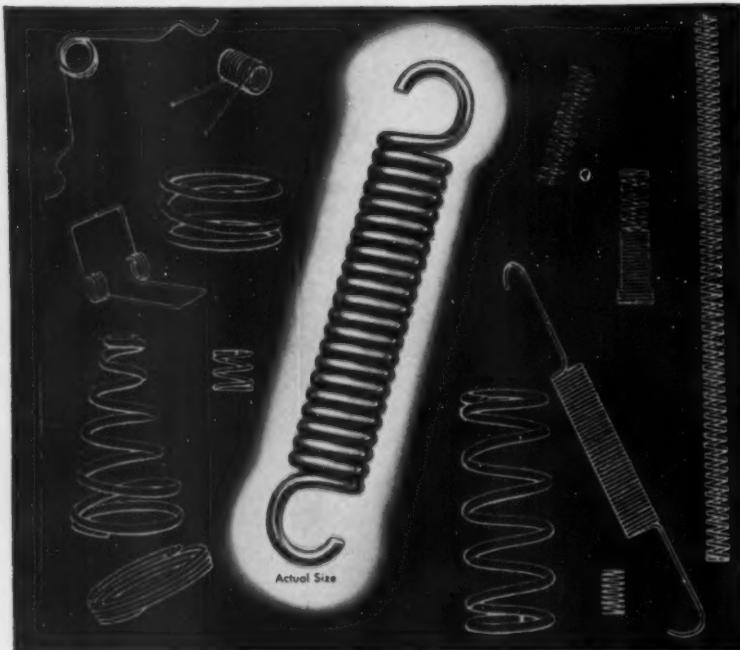
Floyd A. Fowler, named sales representative, northwestern Ohio, industrial gears and speed reducers, Horsburgh & Scott Co., Cleveland, O.

William G. Koles, named sales engineering representative, Michigan, The George Sall Metals Co., Inc., Philadelphia.

Fred W. Ellis, appointed foundry engineer, Hamilton Foundry & Machine Co., Hamilton, O.

William J. Weber, named assistant process engineer, Kennametal, Inc., Latrobe, Pa.

KEYSTONE SPRING WIRE



TOUGH BRAKE SHOE ADJUSTING SPRING

PROBLEM SOLVED!



Wesco Spring Co. of Chicago, Illinois, make springs of many types. But the toughest order in recent years was the brake shoe adjusting spring, shown above. Load and elasticity specs were demanding to provide a vitally important auto part that would permit constant extension without setting. After trying other wires, Wesco consulted their Keystone Wire Specialist and a special, high tensile MB wire was developed for this exacting need. The first shipment of Keystone Wire "hit the nail on the head" and has been specified ever since. Safety-minded automotive engineers—who demand high quality and dependable performance—continue to buy Wesco springs made from Keystone wire, month after month. Just another typical case where Keystone Spring Wire has solved an unusually tough problem.

SEE YOUR KEYSTONE WIRE SPECIALIST

Spring Wire problems? Take them to your Keystone Wire Specialist! High carbon steel spring wire—hard drawn, spheroidized annealed, drawn galvanized and copper coated, MB, HB and music wires—are available in Keystone quality to match your spring needs. Wire for Cold Heading and other industrial uses. Your inquiries are invited!

KEYSTONE STEEL & WIRE COMPANY, PEORIA 7, ILLINOIS



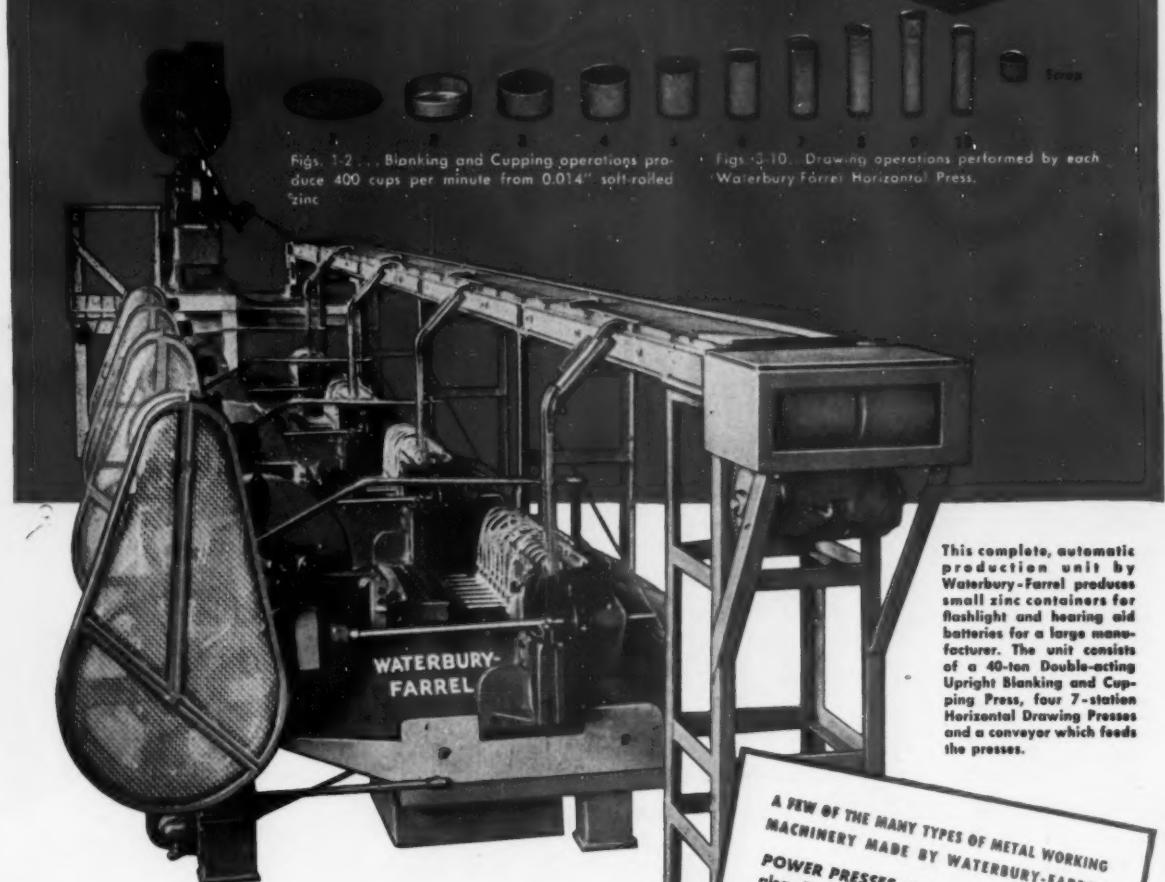
KEYSTONE WIRE for Industry

THIS WATERBURY-FARREL PRESS PRODUCTION TEAM

**draws
340 shells
per minute**

Figs. 1-2... Blanking and Cupping operations produce 400 cups per minute from 0.014" soft-rolled zinc.

Figs. 3-10. Drawing operations performed by each Waterbury Farrel Horizontal Press.



This complete, automatic production unit by Waterbury-Farrel produces small zinc containers for flashlight and hearing aid batteries for a large manufacturer. The unit consists of a 40-ton Double-acting Upright Blanking and Cupping Press, four 7-station Horizontal Drawing Presses and a conveyor which feeds the presses.

Here's an example of the automatic mass production you can get with Waterbury-Farrel horizontal drawing presses.

These modern deep-drawing machines are available singly or in complete production line setups. The presses are available in a wide range of sizes for handling a large variety of work. The number of stations range from 5 to 12; maximum strokes from 3" to 26"; production speeds up to 100 per minute.

Features Include:

- High production — continuous deep drawing with no intermediate annealing.
- Patented shell transfer mechanism.
- Patented die-holder lubrication.
- Horizontally held shells cannot be deformed by trapped liquid.

For further details, write, wire or phone your nearest Waterbury-Farrel office.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY-FARREL

POWER PRESSES—Crank • Cam and Toggle; also Rack and Pinion Presses • Transfer Presses • Multiple Plunger Presses • Hydraulic Presses, etc. **WIRE MILL EQUIPMENT**—Continuous Fine Wire Drawing Machines, including upright Cone and Tandem types, Bull Blocks • String-up Machines • Spoolers, etc. • **COLD PROCESS BOLT AND NUT MACHINERY**—Headers (all types) • Reheaders • Trimmers • Thread Rolling Machines • Slotters • Nut Tappers, etc. • **MILL MACHINERY**—Rolling Mills • Wire Flattening Mills, Chain Draw Benches • also Slitters • Straighteners • Pointers • Swagers • Cut-off Saws • Coilers • Winders, etc.



*In Equipment,
Experience Counts ...*

CINCINNATI RIGID SHAPERS

New—modern—these Rigid Shapers offer faster, more convenient controls, greater accuracy, greater dependability. The New nodular iron ram, trunnion and vise, and wide heavily ribbed column give a new rigidity—increase accuracy in cutting.

The New slot-free ram also eliminates the manual clamping of ram adjustment—a time saving feature.

A speedy, dependable electro-magnetic brake and clutch insure a faster performance.

50 P.S.I. pressure lubrication, exclusive on Cincinnati Shapers, is a real insurance against wear and a guarantee of long trouble-free performance.

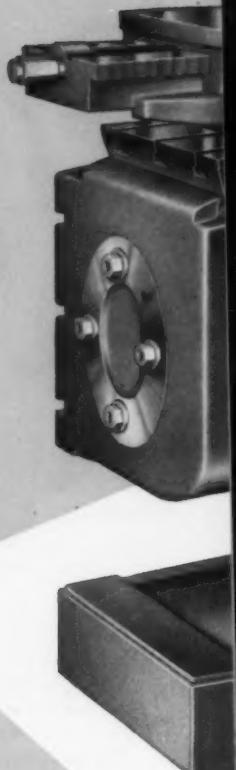
Write for the circular on the New Rigid Shapers.

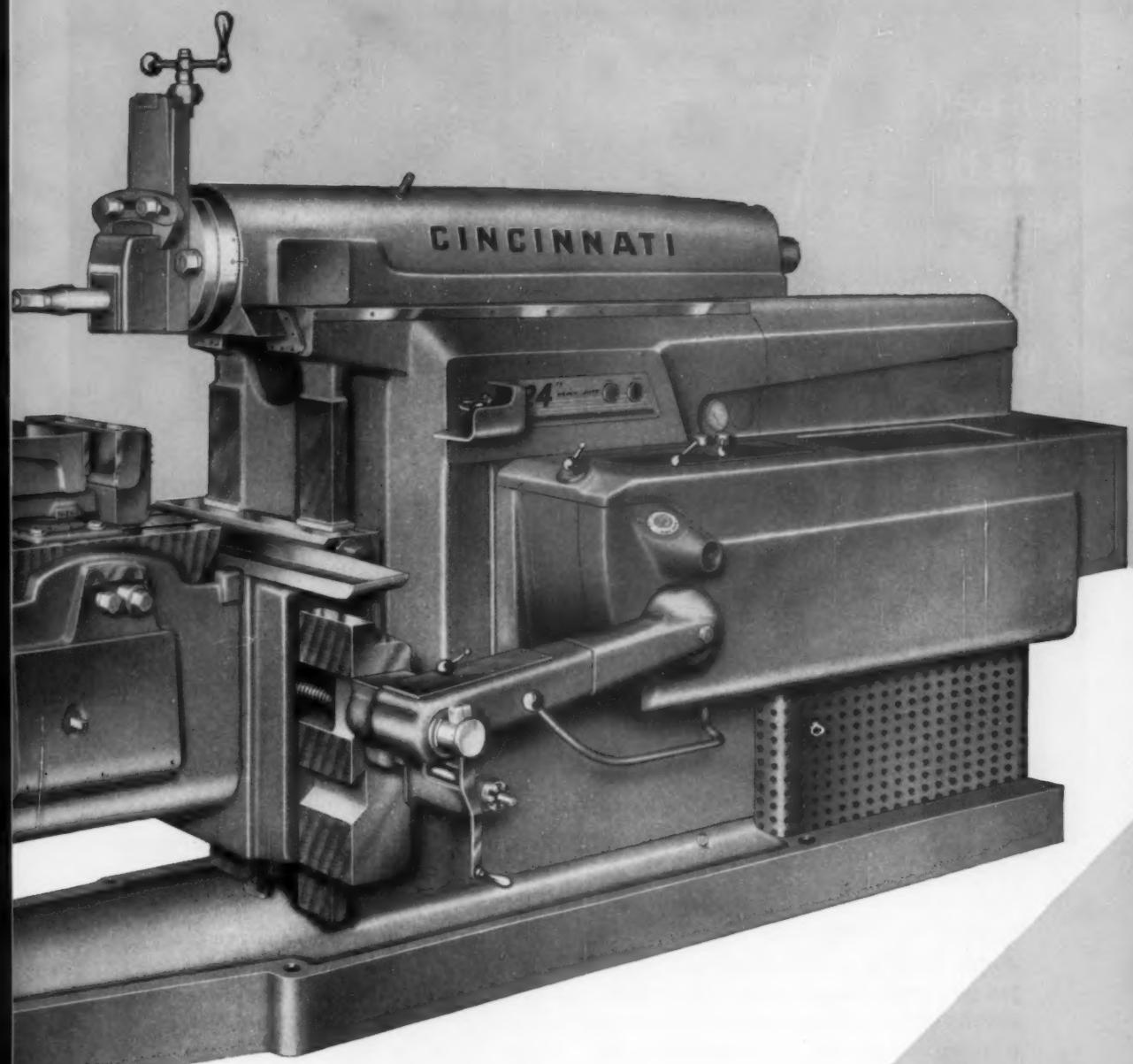


Modular iron, slot-free
ram

Electro-magnetic Clutch
and Brake

The only shaper with
50 P.S.I. lubrication





Cincinnati Shapers, Shears and Press
Brakes carry a 5 year guarantee on work-
manship and material—write for details.

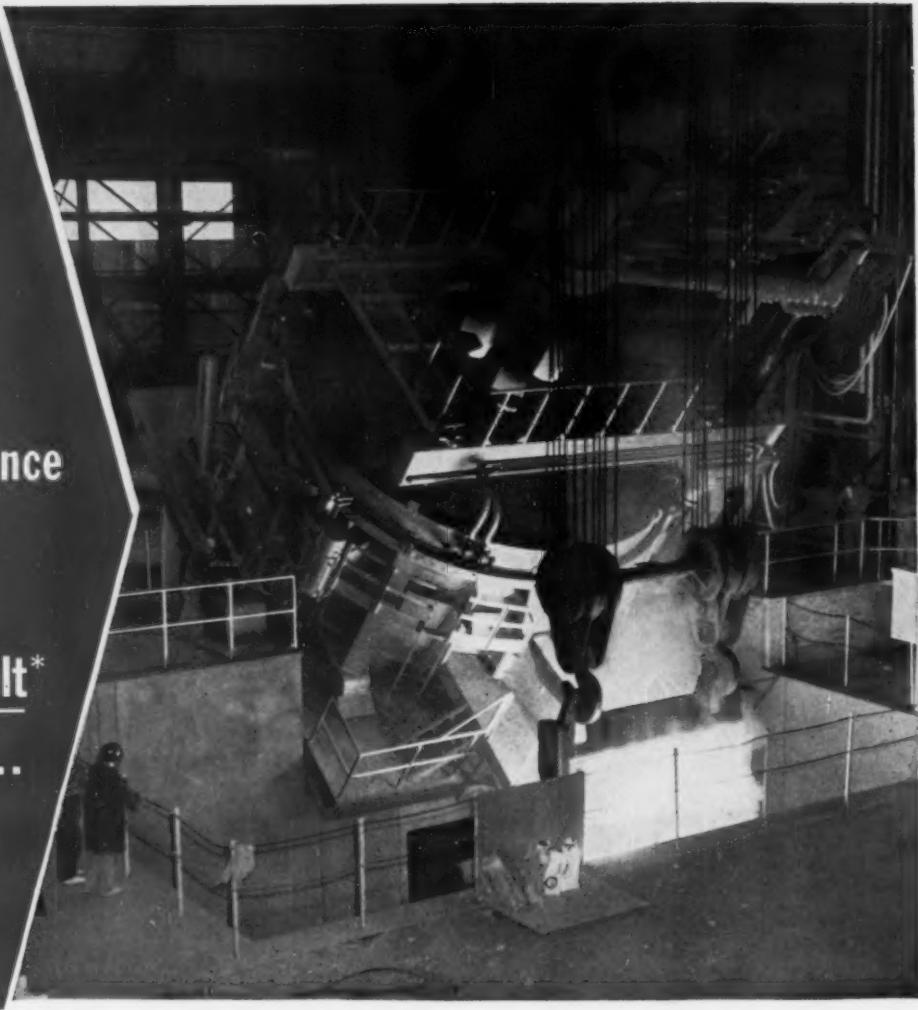
THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES



Based
on the
fine
performance
of this
100-ton
Lectromelt*
Furnace...



this large Midwestern steel company has ordered a second

LECTROMELT FURNACES continue to turn in excellent records of production. The precise control possible with these furnaces contributes to greater uniformity of steels and more accurate alloying. Lectromelt's system of top-charging speeds up output and reduces costs.

Thirty-seven years of experience, engineering and research qualify Lectromelt engineers to build electric-arc furnaces to meet your exact melting needs. Catalog No. 9-A describes these furnaces. Pittsburgh Lectromelt Furnace Corporation, 312 32nd Street, Pittsburgh 30, Pa.

Manufactured in...GERMANY: Friedrich Kocks GMBH, Dusseldorf...ENGLAND: Birlec, Ltd., Birmingham...FRANCE: Stein et Roubaix, Paris...BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege...SPAIN: General Electrica Espanola, Bilbao...ITALY: Forni Stein, Genoa...JAPAN: Daido Steel Co., Ltd., Nagoya

*REG. T. M. U. S. PAT. OFF

WHEN YOU MELT...

MOORE RAPID

Lectromelt



FEATURE
ARTICLES

For sheet metal fabricators—

Cut Blanking Costs With Simplified Design

By FREDERICO STRASSER,
Consultant,
Santiago, Chile

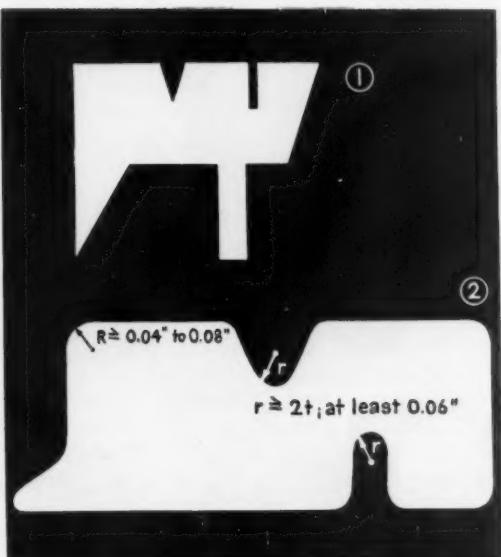
- ◆ Simple blank design provides a direct answer to how blanking costs can be effectively cut . . . Simplicity lowers tool costs, increases production and extends tool life.
- ◆ These down-to-earth hints for basic metal blank design point out the short-cuts that spell economy . . . Based on shop experience, they help make the job of sheet metal stamping easier, far more profitable.

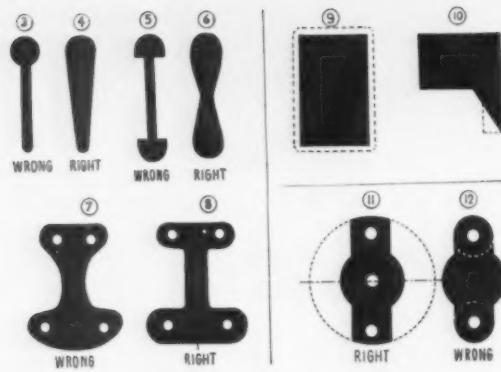
◆ THE BASIC DESIGN of a metal blank is best when it is simplest. For—among other advantages—a simple, well-designed blank can make metal stamping a relatively straightforward metalworking process. Poor design, or design that is overly complex, can result in a painful and costly series of manufacturing headaches.

Simplicity of blank design greatly simplifies tooling. For this reason, it helps hold tooling costs to a minimum. It eases the general problem of manufacturing precision so that the maintenance of tolerances becomes a less critical factor. Most important of all, it eliminates needless rejects and waste while speeding overall production.

A flat metal stamping is simplest and most convenient to handle. As for overall size, metal stampings should be held as small as possible. Larger stampings frequently involve special problems, even when the equipment for their proper handling is available.

Before deciding on stamping large blanks, it





might pay to consider four alternatives: (1) contour-sawing, (2) square-shearing, (3) composite construction and (4) changing the shape.

Although the first two alternatives are fairly obvious, the last two require some explanation. By composite construction is meant dividing a single workpiece into two or more parts. Here, the savings in tools and materials should compensate for the assembling operation if the change over is to be profitable. Shape change, on the other hand, means altering shape, contour, or dimensions in such a way as to make a process other than stamping more feasible.

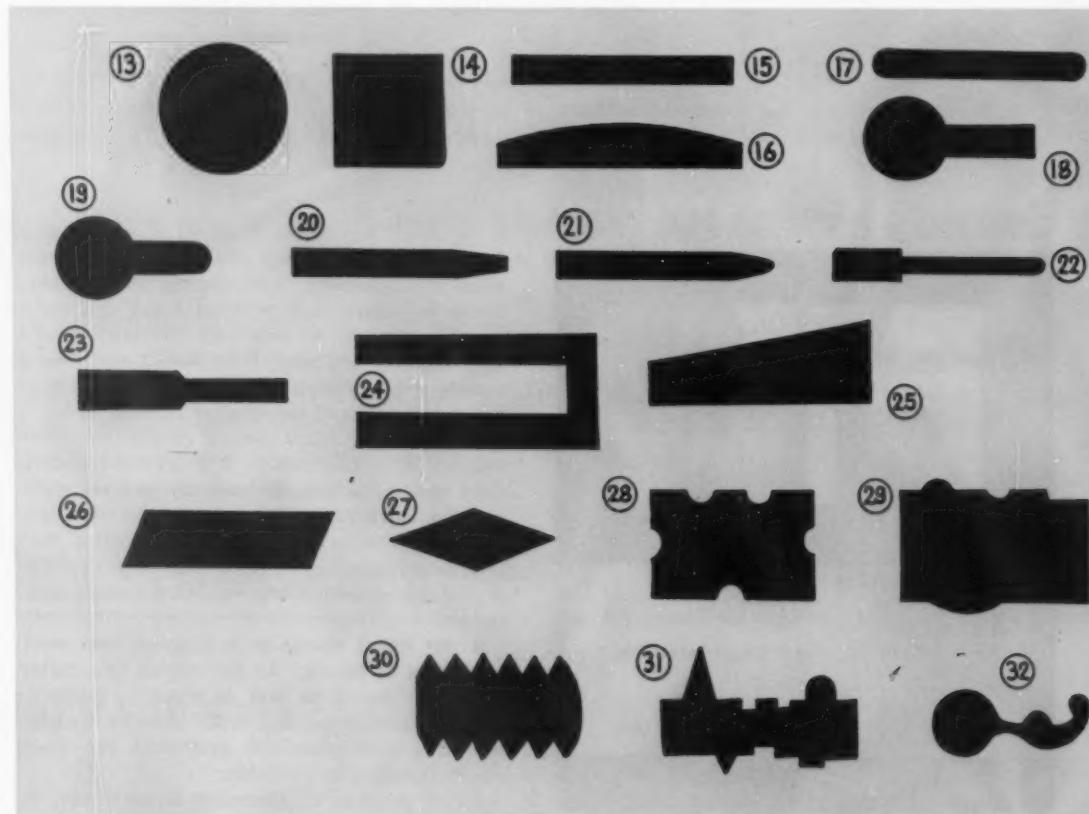
While very large stampings are to be avoided, there is practically no limit on how small a stamping may be. Overall sizes of 0.05 in. are not uncommon. Contour sections as small as 0.003 in. have been blanked successfully.

The tool steel used for die construction is seldom as important a cost factor as the toolmaker's labor. For this reason, the cost of a blanking die is strongly influenced by the contour, form, and intricateness of the blank which the die is to produce.

The more complicated the blank contour, the more difficult and expensive it becomes to obtain the correct fit between the punch and the die opening. Simple and regular geometric shapes, on the contrary, require considerably less die-making time. Die life is also dependent upon design. Simple contours will generally outlast sharp corners, narrow slots, and peninsular projections.

A typical example of poor design is shown in Fig. 1. In Fig. 2, however, troublesome contours have been avoided and design is simplified generally. Figs. 3 through 8 provide additional examples of blanks originally designed incorrectly and later changed to more convenient shapes.

In general, it is best to choose straight, rather than curved contour lines. With the exception of the circle, curved lines require more expensive dies and provide poorer stock utilization. It is

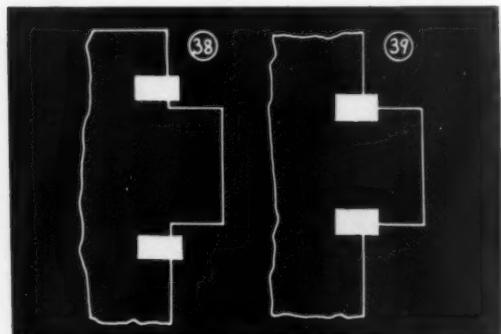


always preferable to use an obtuse angle (more than 90 deg.) with ample radii (0.04-0.08 in.) when making a change in contour line direction. The same general rules apply to corners and the apex of slots.

Slots are cut in stampings for a number of reasons. Sometimes slotting is intended to facilitate a flanging operation. Or it can be introduced to provide clearance or for locating and assembling purposes.

Rules for slotting

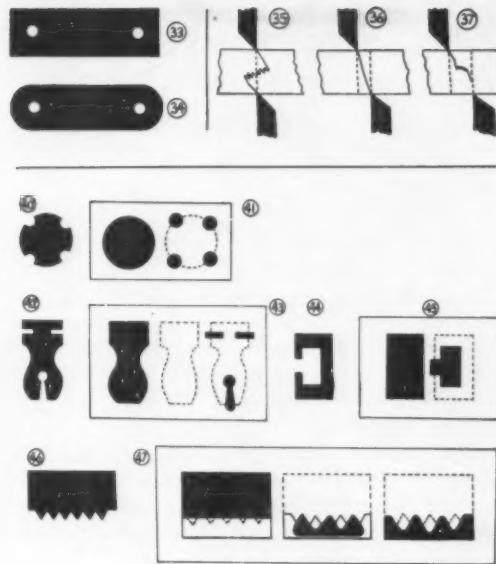
Whatever the reason for slotting, a few general rules have proven helpful. The triangular shape with 60 deg. angles is preferable to the parallel-sided canal. The apex of the slot should be rounded with a radius equivalent to at least twice the stock thickness for all components subject to medium or heavy stress. A sharp apex may be permissible only where stresses are sufficiently low and there is no danger of crack nucleation at the apex.



Sharp, 90 deg. corners should always be avoided. Not only are they difficult to machine, but they are also prone to cracking during heat treatment. Dies with very sharp corners seldom wear well and require more than the average amount of maintenance. Blanks produced from such dies have a greater tendency towards burr formation and edge deformation.

When an important functional requirement demands the stamping of sharp corners, a two-stage operation is recommended. Blanks are cut with an excess of material, as indicated by the broken lines in Fig. 9. The rounded edges are then trimmed in a subsequent operation.

Although designs involving acute angles are even less desirable than those requiring right angles, the procedure for blanking is reasonably



similar. The broken lines shown in Fig. 10 indicate the limits of the preliminary blanking operation. A second operation is required to produce the acute angle.

Whenever stampings approximate a chainlike design, it is good practice to try to design the ends of the workpiece so that they become part of a circle (Fig. 11). A semi-circular layout, such as that shown in Fig. 12, should be avoided. The circular design provides for easier grinding of the corresponding punch.

Circle saves work

The circle is probably the most perfect plane geometrical shape. Round holes and circular sections are usually easiest to machine. Both punch and die can be quickly and accurately made because all machining can be restricted to a drill press and/or a lathe. There is no need for additional bench work, such as hand filing. Grinding and polishing are similarly simplified.

Obviously, there are important functional reasons for blanking stampings that are not round. In such cases, choose the simplest form that is compatible with the function of the component.

Tool and machining costs should always be carefully considered. Figs. 13 through 32 show a series of typical contours in sequence of increasing cost. The higher the number, the more expensive is the contour to make.

As for the form of sheared component ends, it is generally more convenient to make them straight rather than rounded. The design of Fig. 33 is preferable to that shown in Fig. 34. Straight ends require simpler and less expensive dies and involve less material waste. They are also more convenient from the standpoint of locating punched holes or slots.

The side walls of blanks produced from dies usually exhibit two distinct surface conditions.

Proper clearance is essential for good shearing action . . . Too much is as bad as too little.

One is a bright band and the other is an irregular and rough band.

The bright band corresponds to the face which was in contact with the die plate. The rough band was in contact with the punch. The bands are more pronounced with heavier stock. On rather thin stock (less than 0.02 in.), they are scarcely visible.

The overall appearance of the side walls of blanks is influenced by the "clearance" which exists between the blanking punch and the corresponding die plate opening. This clearance varies with stock thickness. As a rule, it is between 5 and 10 pct of the stock thickness.

Clearance is essential to the shearing action. The actual mechanics of shearing begins with the formation of two cracks or fissures. One break starts from the cutting edges of the punch. The other begins at the cutting edges of the die plate. These cracks are not vertical but are slightly inclined.

For optimum shearing conditions, correct clearance is an essential. The effects of too little clearance are shown in Fig. 35. Contrast this condition with correct clearance (Fig. 36) and excessive clearance (Fig. 37).

Sheet thickness counts

The appearance of the side walls of soft blanks is usually superior to that produced with hard stock. Thin stock, similarly, provides a better finish than heavier grades. For this reason, it is good practice to avoid stamping sheets that exceed $\frac{1}{8}$ in. in thickness. Where more strength is required, the designer should consider the possibilities of reinforcing.

For blanks which are to be subjected to additional forming operations, the flow lines of the material should be taken into consideration. To avoid tearing and other problems in bending, the bend should be made at right angles to the flow lines. This is the ideal condition. In some instances, it is permissible to depart from the right angle by as much as 45 degrees.

Experience indicates that there are a number of "short cuts" that help in a variety of stamping applications. For example, where slots are to be punched in a blank in a subsequent operation, the slots should be located in such a way as to provide freest cutting. This principle is spelled out in Figs. 38 and 39. The design contained in Fig. 38 is obviously the easier to manage.

Progressive-type dies can frequently offer easy

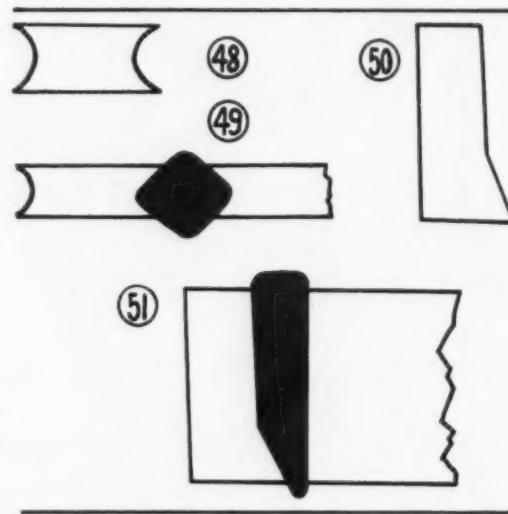
solutions to the problem of blanking difficult or complicated shapes. Normally, the workpiece shown in Fig. 40 would require a rather expensive blanking die. By resorting to a progressive-type die, die construction becomes fairly easy and inexpensive. An acceptable die plate outline for the job is shown in Fig. 41.

All four semicircular trimmings in the discs can now be produced by four small round punches. These punches would first form the four holes in a preliminary stamping operation. The second circular stamping operation would complete the workpiece. Similar job simplifications are shown in Figs. 42 through 45.

Keeps punches sharp

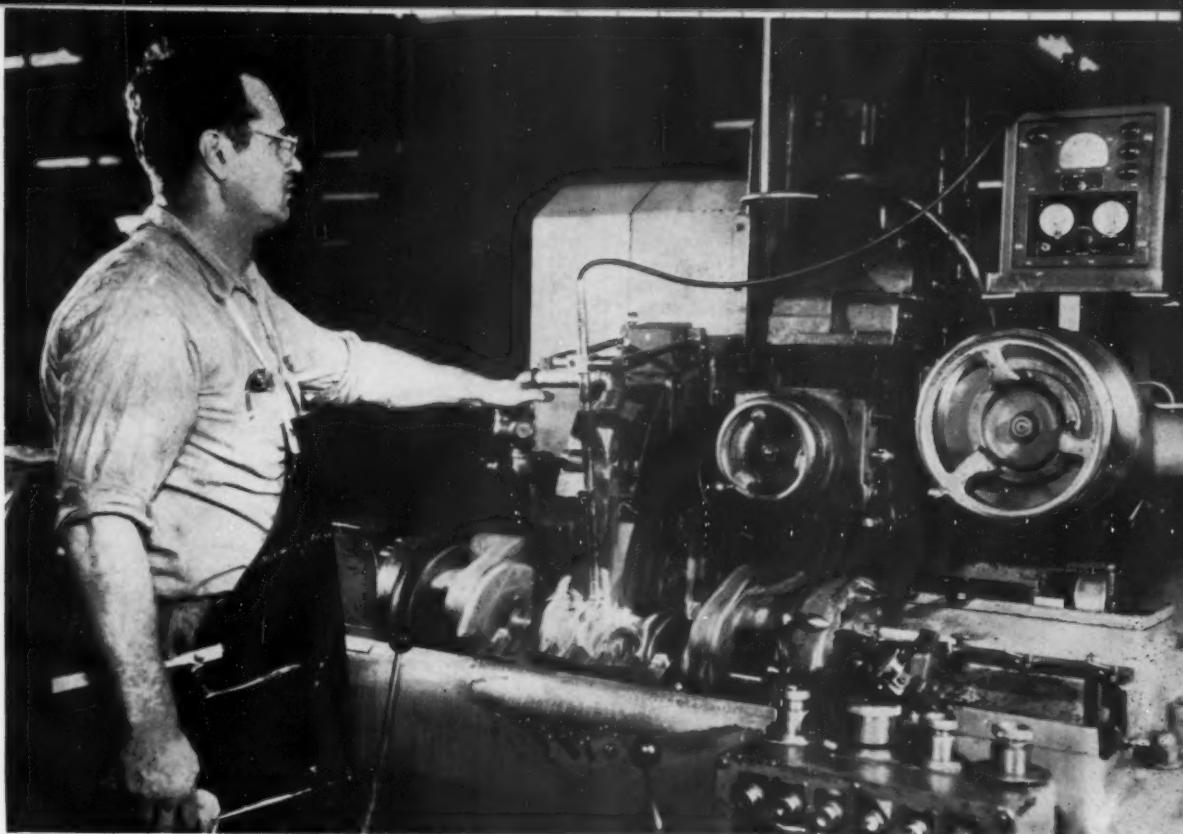
Typical of a kind of design problem that can be solved with progressive-type dies is the workpiece shown in Fig. 46. It was required that this blank be made from thin (0.01 in.) steel sheet. Rectangular in shape, the blank has a series of thread-shaped teeth running along one edge. It was specified that these teeth must be made as sharp as possible.

One of the major problems involved in this design is maintaining the sharpness of the cutting edges used to form the teeth. The problem was ultimately solved by trimming the teeth in two separate operations. Punches with double-pitch teeth were used in a combined cutting operation. The tool built for the job was the three-station progressive die shown in Fig. 47.



Cut-off dies frequently help to simplify metal stamping. The workpiece shown in Fig. 48, if produced with an ordinary blanking die, would require both a punch and a die plate. Using a cut-off die simplifies heat treatment, production processes and also results in considerable savings.

Figs. 50 and 51 provide additional examples of how a cut-off die can be used advantageously at lower cost.



INSTALLATION of control unit on this Landis crankpin grinder required less than seven hours.

Fits existing machines—

Get Better Grinds With New Control Unit

♦ A new electronic control unit can be fitted on your present automatic grinder in a matter of a few hours . . . Built for precision, yet ruggedly dependable, its circuitry is designed to insure a maximum of repeat accuracy.

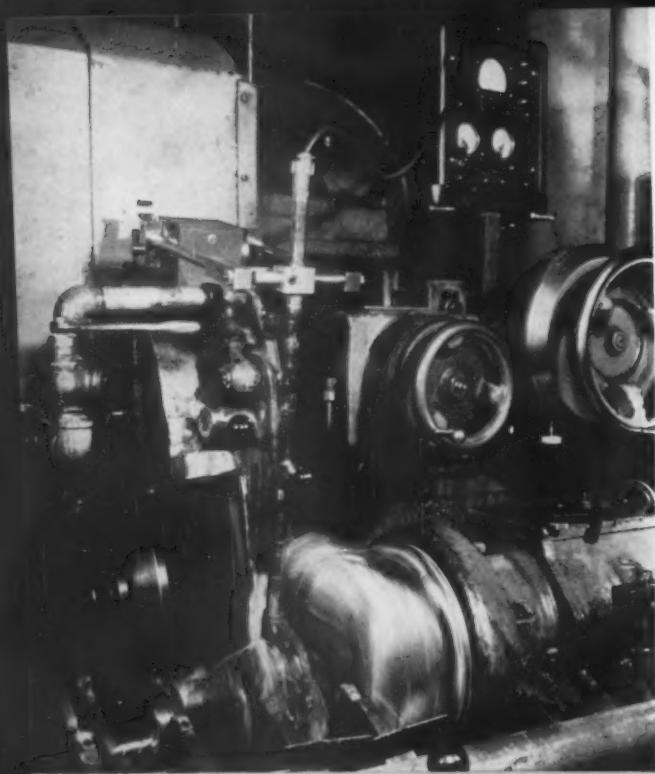
♦ Conversion of a Landis crankpin grinder to the use of this new device took less than seven hours . . . Even removing 0.075 in. (diam) of metal in 45 seconds, accuracy of the operation is maintained to approximately 0.0001 in.

♦ YOUR PRESENT AUTOMATIC grinders, or those you may be planning to buy, can now be rapidly equipped with a new electronic gaging unit for dependably precise control of workpiece size and surface finish.

It took just seven hours at General Motors' Cadillac Div., for example, to fit a Landis crankpin grinder with one of these controls and get the machine back into production. Job of this grinder is to remove more than 0.075 in. (diam) of stock from each crankpin in about 45 seconds. Even with this high infeed rate, the gage-controller holds size accuracy to about ± 0.0001 in.

The new Microtrol gage was developed and is manufactured by Airborne Instruments Laboratory, Inc., Mineola, N. Y. Starting point for the firm's engineers was one attribute of electronic gaging which is especially important in

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Mineola, N. Y.



MEASURING accuracy is not affected by oil, water, grit, vibration or variable surface finish.

machine tool applications: the ease and flexibility with which the gaging information may be directly used for machine control.

In addition, the following practical specifications (from the user's viewpoint) were listed as design essentials:

1. The unit must be rugged, with built-in stability and long life.
2. It must be accurate, with ultimate accuracy limited only by the physical geometry of the work and the machine setup.
3. It must have large indicators and be simple to adjust.
4. It must be immune to outside electrical and mechanical disturbances. To achieve this and still make accurate measurements in the presence of oil, water, grit, vibration and variable surface finish, the unit must get true diameters by using gage heads that contact the work with very light force.
5. The unit must be suspended in a rugged, dependable fashion so that gage approach is accurately repeatable from part to part. At the same time, gage wear and any tendency to mar the part must both be negligible.
6. It must be simple and quick to install, not requiring any special modifications on existing grinders.

These objectives could not be realized by any simple combination of old techniques. A completely new approach was required. Even such seemingly straightforward items as the suspen-

sion and counterbalance system were especially designed to meet customers' needs. The present basic design is the result of extensive development and field testing.

Principles of operation of the new unit are illustrated in the accompanying block diagram.

Heart of the system is the precision electrical measurement transformer contained within the gaging rod. This device translates measurements of the workpiece diameter into a precision voltage. This voltage is converted within the electronic unit to actuate the ruggedized contact meters, and in turn, the power relays and machine solenoids.

Tube replacement simple

The gaging rod and caliper are maintained in accurate contact with the work by the counterbalance spring and linkage system, which serve to provide an accurate gaging force of six ounces. The gaging anvils are precision radius sapphires which minimize wear and size drift.

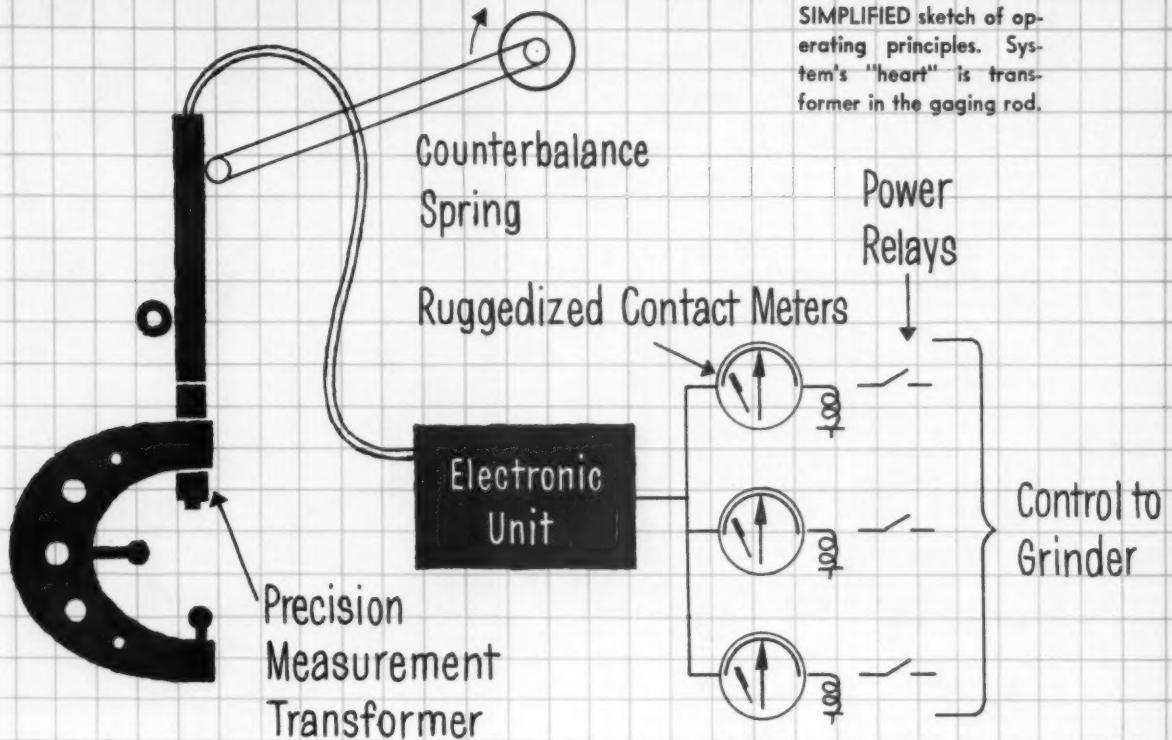
The electronic circuits are of an advanced, high-reliability design. They utilize only two standard, receiving vacuum tubes, each of which has an average life of 5000 hours. Tube replacement is simple, and is the only service the unit requires in normal usage. An added sign of the device's electronic stability is that gaging is not normally affected by line voltage variations between 70 and 140 v, when the nominal value is 115 v.

In actual operation, controlling the Landis grinder at the Cadillac plant, the machine and gaging sequence is as follows:

1. Operator loads and starts machine.
2. After a short period of rough grinding, the operator swings the gage into contact and the automatic control takes over.
3. At the first size limit, "Limit B" indicator light goes on and the grinder automatically switches to slow infeed.
4. At the second size limit, "Limit A" indicator light goes on and the grinder automatically switches to dwell, or sparkout.
5. At the final size limit, the "On Size" light flashes on and the grinding wheel withdraws.

One significant feature apparent in the foregoing sequence list is the use of the three-point, or three-stage control principle rather than a simple on-size shutoff. The triple-stage control system guarantees constant cooling time with slow feed. It also results in a sparkout which is repeatable from part to part. Both of these conditions are important in achieving the highest accuracy and best possible surface finish.

Setting the crankpin machine to obtain the proper "tapering off" characteristic in the sparkout was done readily with the aid of the large indicators and convenient controls on the gaging unit. As a result of the repeatable



sparkout, an immediate improvement was noted in workpiece surface finish.

Prior to the new gage-control installation, the grinder had been equipped with an air-type gage which used a mercury column to read back pressure and convert this pressure to control signals.

Stability of the new gaging unit is indicated by the fact that no sizing adjustments, at all, are required to be made on it for periods of several days. At these infrequent periods, all that is needed is a simple adjustment of the large calibrated control knob.

Unit installed quickly

Another important feature is the ease and rapidity with which the gaging equipment can be installed on existing grinders. In general, this involves drilling only three holes for suspension mounting, plus the simple connection of six wires to the machine solenoids. The complete installation at Cadillac took the grinder out of production for less than seven hours.

The adaptability of the new control unit goes much further than the plunge grinder application described here. Other types are available with several variations in both the suspension system and the caliper head to allow installation on various classes of grinding machines. And the basic elements of the control device are being applied to the solution of many more grinder problems, both internal and external.

POTENTIAL USERS SPECIFIED THESE FEATURES:

1. Rugged design for long life, trouble-free operation.
2. Maximum accuracy within limits of workpiece and machine setup.
3. Simple adjustment; large dial indicators and lights.
4. Top performance despite presence of dirt, grit, liquids, vibration or line voltage variations.
5. Minimum drift in work size, coupled with minimum wear in all gage components.
6. Sturdy suspension coupled with minimum pressure on work.
7. Quick installation on existing grinders without requiring major machine alterations.
8. Rough, finish and sparkout controls with separate dial and indicator light for each operation.

On a high-speed line—

Uniform Output Keyed To Better Handling

♦ Talk about automation makes it easy to forget there's many a case where manual transfer and positioning can do the job better . . . Where human hands can be the key to smooth, continuous production at competitive costs.

♦ Even in high volume production of such small parts as diecast strikers for car doors, manual operations can be widely used . . . Particularly if supplemented by automatic equipment in machining and plating operations.

By HERBERT CHASE, Consultant,
Forest Hills, N. Y.



DIECAST door strikers are racked by hand before transfer to automatic zinc plating setup.

♦ FULL automation doesn't have to be a requirement of high speed production. Even in manufacture of small, intricate parts, manual handling can often play a vital role.

At General Motors new Ternstedt Div. plant in Flint, smooth and continuous flow of diecast parts in high volume is keyed to manual handling. There are automatic machines, and liberal use of conveyor belting as well. But production cost figures prove that many operations are better and more efficiently handled by hand.

Strikers for automobile car doors are typical of the numerous parts manufactured in large volume at Ternstedt Div. Consistent high quality and good surface finish are needed, the latter not only for the sake of appearance, but also to withstand possible corrosion and mechanical abuse in service.

Zinc alloy discastings were selected for strikers, partly because they meet service requirements, and partly because the metal is easily cast to the irregular shapes specified. Appearance also is enhanced by bright plating with zinc, even though the casting itself is SAE 903 zinc alloy.

Castings are produced within the plant, in

what is claimed to be one of the largest diecasting setups found anywhere. Six-cavity dies cast three right and three left strikers simultaneously, each measuring $2\frac{1}{4} \times 4 \times 1$ -in. thick. Each gate of six castings is quenched after lifting from the die. Presses then shear off sprues, runners, gates and flash.

Trimmed castings are dropped onto belts that elevate them to hoppers near drilling machines. Trimmed scrap is air ejected or manually thrown into chutes discharging onto a trench conveyor which returns to the melting furnaces.

Striker castings feed to one of three special drilling machines via a chute. They are manually placed and toggle locked at the front station of a vertically indexing fixture.

Fixture advances part

At the first station, a stepped cross hole is through-drilled for a pin. When the casting reaches a second station, a special hollow tool cuts an annular recess around one end of the hole, leaving a thin wall. After a cross pin is inserted, the thin wall is spun over in a later operation to hold the pin in place.

Each casting is slot-milled in a special two-spindle machine equipped with a four-place fixture. The fixture oscillates, advancing two castings into the cutters simultaneously while two other castings are loaded at the opposite end. On reversing, the outer pair of castings are slotted while the first two are unloaded and two new castings are put in place. After completion of this operation, housings move by belt conveyor to the plating area.

Striker castings at this point are of as-cast

smoothness with frosted rather than bright surfaces. They could be polished, buffed and plated, as many other castings are in this plant, but this would add unnecessary operations. Instead, castings are moved directly through automatic washing and bright zinc plating operations.

Racking for zinc plating is manual: castings are picked from the belt, and set onto the racks. As these are filled, racks are removed by an operator and loaded on the conveyor of the automatic plating machine.

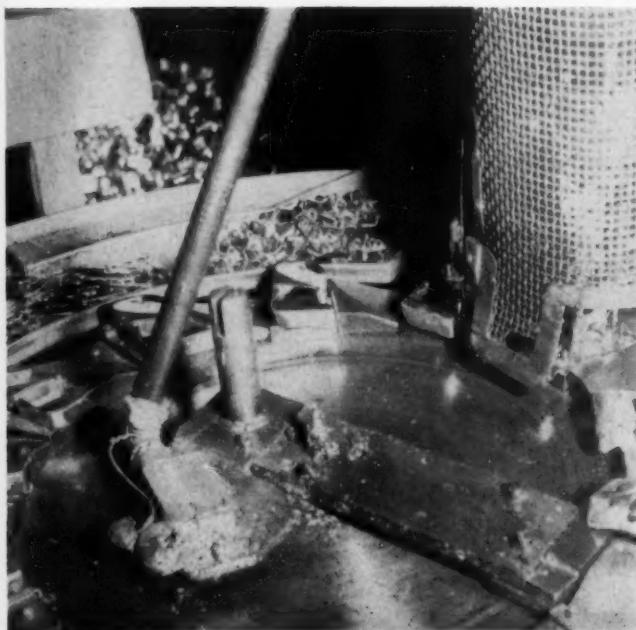
Castings pass through specified cleaning baths and rinses, then enter the bright zinc plating solution. When they emerge, they are rinsed, dried and unracked by hand.

After plating, housings are placed in an indexing setup for certain assembly operations. One of these involves hand-placement of a stamped strip with a hole at each end over hollow-ended integral studs cast on the striker housing. At a later station, the studs are spun over the hollow ends, thereby fastening the stamping permanently to the casting.

Timing of the entire operation is such that casting, trimming, machining, plating and assembly are kept in step. A continuous flow of finished and assembled strikers reach the end of the line ready for shipment to Fisher body plants.

Below-Left: INDEXING machine assists in assembly of striker, helps increase efficiency of operation.

Below: MANUAL transfer and positioning still play a strong role, even in modern high production plants.



Appeals to platers, users—

Can Tin-Zinc Plating Improve Your Products?

- ◆ Plating with the dual tin-zinc alloy can be handled without difficulty using standard equipment . . . Advantages are many, including excellent solderability, corrosion and abrasion resistance, ductility and appearance . . . Immediate applications are numerous.
- ◆ Production plating of tin-zinc alloys shows anticipated problems to be non-existent . . . The binary alloy plates directly on most common basis metals . . . Throwing and covering power are excellent, even in still tanks at low voltages.

◆ ELECTROPLATED tin-zinc is the latest entry into the alloy plating field and is already showing promise of becoming one of the most important combinations of co-deposited metals. It is getting top odds from many metal finishers by offering all the major advantages of zinc, cadmium and tin, at less than two-thirds the cost of cadmium plate. Further, the plating alloy possesses many desirable traits not found in any of the three metals.

Actual production experience by a number of platers attests to these advantages: 1) Excellent solderability of the tin-zinc alloy. It also is outstanding in retention of good solderability after aging and exposure. 2) Low contact resistance, encouraging its use in electrical applications. 3) Good corrosion resistance, even in thicknesses down to 0.3 mil. 4) Satisfactory abrasion resistance, which may be upgraded to an excellent rating with a plating thickness of $\frac{1}{2}$ mil or more. 5) Extreme ductility, permitting forming, bending and deep drawing operations. 6) Most interesting

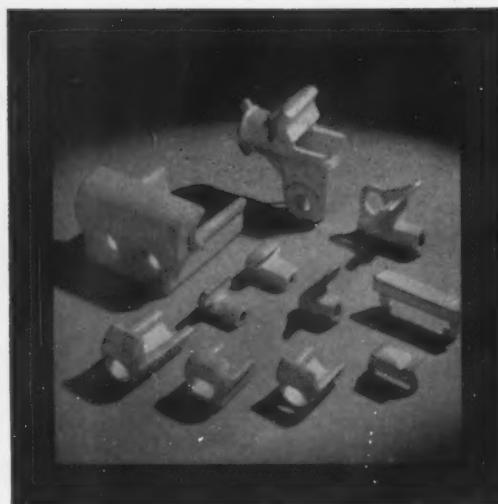
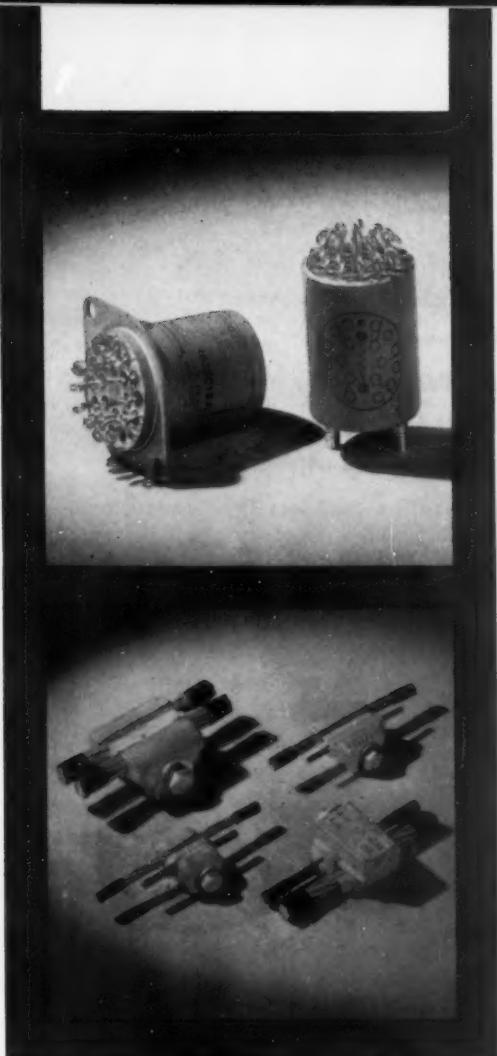
and useful high-frequency electrical properties. 7) A pleasing, satin-white matte appearance, much like electroplated tin.

Plating operations are simple, easy to follow and can be duplicated consistently. Standard plating equipment is used. Securing uniform thickness of deposit presents no problem. Throwing power of the bath is excellent, better than either zinc or cadmium, even in still tanks at low voltage. The alloy can be plated directly on most common basis metals without striking or special cleaning measures.

Plate any tin-zinc combination

Virtually the whole range of tin and zinc alloys can be electroplated. The alloy with a nominal composition of 78 pct tin, 22 pct zinc has been found most useful on the basis of experience. Considerable tolerance is permissible. Limits are not critical. Properties of the deposit vary but slightly within a wide range from 70 to 85 pct tin and from 15 to 30 pct zinc.

By F. A. LOWENHEIM,
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Electrochemical Research,
and R. T. GORE,
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Metal & Thermit Corp.,
New York City



Above: RESISTANCE to corrosion and abrasion plus top appearance are advantages of plate.

Top—Left: SOLDERABILITY of Sn-Zn alloy plating after aging cuts relay assembly costs by eliminating pretinning step.

Left: TIN-ZINC plate on cable connector minimizes galvanic corrosion between copper and aluminum cable.

When zinc content of the deposit increases beyond 30 pct there is some tendency to corrode under salt spray test conditions, i.e., to form the white corrosion products characteristic of zinc plating. Similarly, if zinc content falls below about 8 pct (the eutectic composition), corrosion resistance tends to suffer—it becomes more like that of pure tin.

Tin-zinc can be plated directly on most common basis metals. It adheres well to steel, cast iron, copper, brass and bronze. It plates with excellent results on aluminum after acid etch baths, zincate immersion and a bronze or copper strike.

Thickness of the deposit may be simply varied to satisfy specific requirements. Excellent solderability is assured by a plating thickness from 0.00015 to 0.00020 in. For corrosion resistance, thicker deposits are plated: 0.0003 in. meets 50 to 100 hour salt spray requirements. For increased abrasion resistance, deposits 0.0005 to 0.0007 in. are commonly employed.

Increasing thickness of the deposit appears to introduce no technical difficulties. The plate is extremely ductile. Forming and bending after plating are easily accomplished without cracking or peeling of deposits.

Appearance of the deposit is pleasing, though not "bright" in the usual sense of the word. Deposits in the 78 pct, 22 pct tin-zinc range are satin-white with a matte appearance, much like electroplated tin. The plate is usually put into service without supplementary treatment. If the alloy's slight tendency to finger stain is objectionable, the plated surface may be protected with a wax or water dip lacquer coating.

Covers any shape uniformly

Throwing power and covering power of the bath are excellent, approximately equal to stannate tin, and therefore better than zinc or even cadmium. Throwing power is markedly superior to that of zinc alone, even when the latter is plated from cyanide electrolytes. Tin-zinc plated parts sectioned for testing show negligible variation in thickness of deposit, even in drilled holes and recesses.

TIN-ZINC ALLOY PLATING

For The User

- Excellent solderability**
- Good corrosion resistance**
- Good abrasion resistance**
- Extreme ductility**
- Low electrical contact resistance**
- Pleasing appearance**

For The Plater

- Uses standard equipment**
- Uniform thickness**
- Excellent throwing power**
- Excellent covering power**
- Plates directly without striking**
- Application cost less than cadmium**

The tin-zinc deposit is easier to solder than zinc, cadmium or even a hot solder dip finish. Frequently, no flux is required. Furthermore, good to excellent solderability is retained throughout extended storage of plated parts. In this respect, tin-zinc alloy is superior to pure tin plate. The deposit is less porous than pure tin of comparable thickness.

If better corrosion resistance is desired the plated work can be dipped in a 2 pct chromic acid bath. The chromating treatment adds materially to salt spray resistance of the alloy plated surfaces.

This combination of outstanding solderability and good corrosion resistance has made the tin-zinc alloy particularly attractive to the electrical and electronics industries.

Solderability of the tin-zinc alloy enabled one electronic equipment manufacturer to meet an Air Force specification which no other plating technique evaluated could come up to. Filters, Inc., Fort Washington, N. Y., makes subminiature relays for avionic and electronic equipment. It uses the tin-zinc alloy for plating relay cans as well as complete hermetically-sealed relays.

Retains solderability during storage

In this application, the tin-zinc alloy is highly valued for its retention of solderability on aging. Filters, Inc., formerly used cadmium plating on these parts, but found them solderable for only a day or two after plating. A proprietary dip was therefore used. This had to be removed in order to solder the armature into the can. It was also necessary to use a flux, objectionable because gases might get inside the can and contaminate the relay contacts.



DUAL metal alloy plates directly on most common basis metals, has excellent throwing power.

In one prior operation, solder was placed on top of the can and flowed with induction heating. The cadmium plate lifted off before the solder would flow, even with very low power. The tin-zinc plating now used solders very well under these same conditions.

Filters, Inc., plates its parts 20 minutes in a still tank. With the former plating method it was necessary to pre-tin the inside of the can, as the cadmium solution would not otherwise adequately cover the interior. The tin-zinc is deposited in approximately the same thickness on the inside and outside of the cans. Equally important, the pre-tinning step has now been eliminated.

Fargo Mfg. Co., Poughkeepsie, N. Y., uses tin-zinc alloy plating on both bronze and aluminum connectors for power utility overhead lines. These clamps connect both aluminum and copper cables. They are plated to make

them suitable for contact when connecting the dissimilar metals.

Fargo adopted the tin-zinc plating after prolonged study. Final decision in its favor was in large part due to the alloy's low contact resistance, most important in an electrical connection. The plating also overcomes the inherently high contact resistance of surface oxides coating the jaws of the aluminum clamp. In addition, the plating minimizes the dangers of galvanic corrosion. Formerly additional operations were required to assure maximum protection between the copper and aluminum.

Fargo engineers find the tin-zinc alloy is superior to cadmium under both salt spray and outdoor exposures, in their application. In addition to excellent corrosion resistance, its retention of inherently low contact resistance after extended shelf life is an important advantage.

Deposits even thickness

The clamps are plated for Fargo by E. H. Kirkpatrick & Son, Kingston, N. Y. Both still tank and barrel plating methods are used. Bath composition deposits 80 pct tin and 20 pct zinc. A thickness of 0.5 to 0.7 mils is plated.

Kirkpatrick checks caustic and cyanide daily, metal content of the solution weekly, and uses an electronic tester for gauging deposit thickness. No difficulty is experienced in maintaining uniform thickness of deposit on all surfaces of the parts, due to the excellent throwing power of the solution.

The bath used for producing the tin-zinc alloy deposit is basically a potassium stannate tin solution, plus a small amount of zinc cyanide and larger proportions of potassium cyanide. Two formulations are used, one for still tanks and automatics, the other for barrels. Complete details on make-up and control of the solution, are available.

In barrel plating there is a tendency to plate a higher percentage of tin than desired in low current density areas. This necessitates use of a bath favoring deposition of zinc under these conditions. This is easily done by altering the still tank formulation to provide lower concentrations of tin and higher concentrations of zinc and potassium hydroxide.

For still tanks a 6-v source of direct current power is usually sufficient. For barrel plating, 12 v or more may be required. Cathode current densities range between 10 and 75 amp per sq ft. Anode current densities run from about 15 to 25 amp per sq ft.

No special precautions are necessary in preparation of work for plating. Conventional cleaning cycles are satisfactory. Rinsing after plating should be thorough, since the tin-zinc bath is a solvent for the deposit. If not thoroughly rinsed off it may cause premature fail-

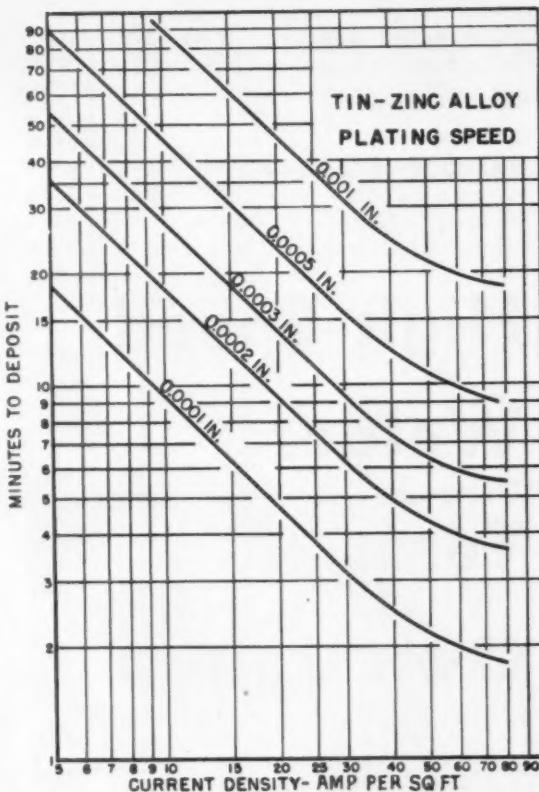


FIG. 1—Nine minutes at 30 amp per sq ft plates 0.0003 in., commonly used for corrosion resistance.

ures. The plating tank can be welded mild steel. No tank lining is necessary.

Anodes should be of the same alloy composition as the desired deposit. In general, anode area should exceed work area in a ratio of 1.5:1 or 2:1. This requirement is necessary since permissible cathode current densities are higher than anode current densities.

For satisfactory operation, anodes must be filmed. The film is a light yellow-green in color, easily recognizable after a little experience. Presence of the film is visual assurance that the tin in the anodes is dissolving as stannate ions and not as stannite or stannous (bivalent) tin.

To form the film, a current somewhat higher than normal operating current is impressed upon the anodes for a short time. Usually less than a minute will suffice. The film is lost from the anodes during shutdowns and must be reformed each time the bath is started up.

Analysis of the solution at regular intervals is important in tin-zinc alloy plating. Daily checks of total potassium cyanide (KCN) and free potassium hydroxide (KOH) are suggested. Weekly analysis should be sufficient for tin content (potassium stannate) and zinc content (zinc cyanide).

To 4000-lb pull—

High-Speed Welder Tests Own Joints

♦ Soon to be installed welder will test its own joints to a 4000-lb pull at 800 per hour . . . Flanged rods are automatically weld-fabricated from stamped washers and thick coil stock.

♦ Air-operated test equipment picks up faulty welds by stressing part far in excess of that normally found in service . . . Flanged rod supports and prevents vibration of washing machine spin-basket.

By GLEN FARRINGTON,
Welding Engineer,
Whirlpool-Seegar Corp.,
St. Joseph, Mich.

♦ TENSION testing of weldments soon will be handled automatically by the same machine that turns out 800 welded joints hourly. Welded flanges produced at St. Joseph, Mich., and Clyde, O., plants of Whirlpool-Seegar Corp. now are pull tested to 4000 lb in separate, manually loaded equipment.

Modern automatic washers for home laundries are produced by Whirlpool-Seegar under both Sears-Kenmore and Whirlpool labels at the rate of several thousand a day. Each washer requires three rods to suspend the whirling, pierced steel cylinder or basket and its drive. Purpose of the rods is to prevent machine vibration and "walk" when spin-drying eccentrically loaded clothes at high speed.

Rods are headed or flanged at each end. Heads are embedded in rubber supports when assembled in the machine, and sustain a considerable pull as the washer is in operation.

Each rod is made from a 17-in. length of 7/16-in. diam wire. Stock is purchased in coils and runs continuously through the straightening rolls of a Lewis machine. A flying cutoff produces 9000 lengths hourly.

Initially, use of a double-end heading machine was considered. Its cost including tooling

was calculated at more than twice that for the complete setup needed to stamp and weld a flange to each rod end. Moreover, welded rods have been found to have greater strength than headed ones.

Production line is based on the automatic machine for assembling and resistance welding a rod and two washers simultaneously. A separate air-operated machine tests each weldment individually to 4000 lb. Dies and presses for producing the stamped washers are included, as are special heads for chamfering each rod end prior to welding.

Assembled with stamping

Before loading each rod into a hopper, a stamped metal half socket is placed over it. This socket later supports a rubber vibration mount. It must be installed at this point because the center hole in the socket is smaller than the washer diameter.

At the bottom of the loading hopper, the rod rests on a pair of chains indexed by an Erricson unit that applies a 20-lb pull. These chains carry the rod through the welder.

At the first work station, each rod comes in line with cutters operated by Kingsbury heads.

Each cutter advances simultaneously, one into each end of the rod to produce chamfers on the shoulders.

Near the delivery end of the Federal welder, two inclined rotating hoppers feed washers automatically down inclined track magazines. Washers land automatically, one at each end of the rod.

As soon as each washer is placed, it is pressed inward by welding electrodes that advance from both sides of the machine, 180° apart. At the same time, a second pair of electrodes grips the rod near each end, but inside the washers.

Current flows from the two end electrodes through the washers to the two gripping electrodes. End electrodes are attached to standard, spring-loaded, hydraulically-operated, projection welding heads. A welding force of 2000 lb is developed.

Current is responsive to "slope control," and is built up gradually to about 35,000 amp maximum, sufficient for good welds in this application. Pressure exerted during the weld upsets the heated metal and shortens the rod. At completion of the operation, chamfers at ends of rod disappear, and it is full wire diameter from flange to flange. Complete fusion occurs between the rod and the two washers, resulting in an integral flange.

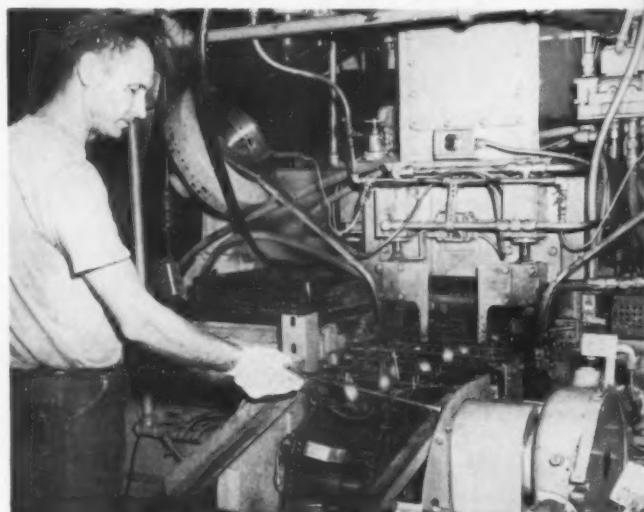
Verified by pull test

To guard against the possibility of inferior welds, each rod end is subjected to a 4000 lb pull in a separate test machine. Test equipment is air operated and loaded by hand. Flanges at each rod end are set into slots in heads spaced the correct distance apart.

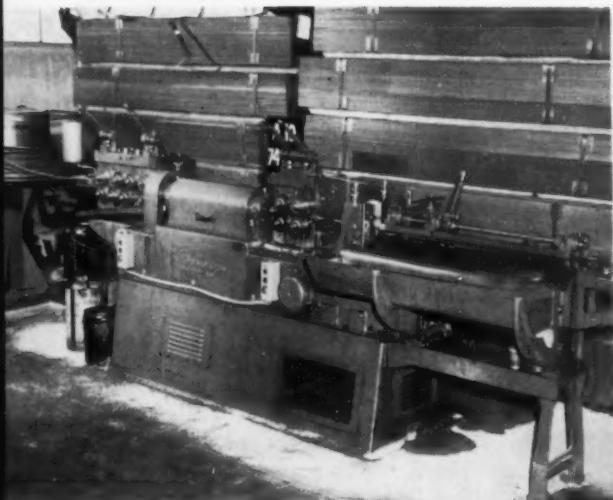
As soon as the rod is loaded, the operator presses two buttons, one with each hand. The 4000 lb pull is many times that encountered in service. Faulty weldments are few, and are scrapped.

Testing readily keeps pace with the welding machine output, 800 hourly. Welds are ductile, and other tests indicate their breaking strength is greater than that of flanged rods produced by cold heading.

Equipment to be added shortly will incorporate the pull test as an automatic feature of the welding machine to provide even higher output.



STAMPED washers feed down track (l and r), are resistance welded to rods at 800 per hour.



COIL STOCK 7/16 in. diam is straightened continuously, cut off in 17-in. lengths at 9000 hourly.



PNEUMATIC equipment pull tests weldments on flanged rods to 4000 lb at high speed.

Bent by bulldozer—

Induction Heater Paces Speedy Forging, Bending Line

◆ INDUCTION heating equipment now enables speedy and continuous production of heavy duty forgings for lift truck forks. Elimination of furnace delays makes possible upsetting, forging and bending operations at rates from 250 to 400 truck forks a shift at the Buchanan, Mich., plant of Clark Equipment Co. Much of the high production speed may be attributed to the fast-acting induction heater.

Production starts with cutting SAE 1045 bar stock, employed for both hardness and strength. The bent section of the fork must be thickened, partly because of the high stress concentration there. Fork tines are later tapered to facilitate pushing them under pallets and other loads in service. The entire workpiece is forged and formed with the realization that it will take a beating in service, and will be subjected to strong bending and tension forces, as well as shock loading.

Where the bend is to be made, an upset is required. In seconds, a special Tocco coil energized by a 200-kva induction heater pushes up temperature in the local area to that needed for forging.

The workpiece is immediately transferred to an upsetter. Heated area is upset by a blow struck while the bar stock is gripped by a die. About 250 forgings are heated and upset in one 8-hour shift.

Restore width

A tapering operation follows. After one end of the bar is heated to temperature in the slot of a box-type furnace, it is passed between No. 12 National forging rolls. Rolls are shaped to form a gradual taper from bar end to that area previously upset. The workpiece is again passed through the same pair of rolls, this time vertically between slots, to restore the original width. One operator double-rolls about 400 pieces per shift.

Before tapered and upset bars are bent, the



BULLDOZER forming block advances to bend truck fork at local area previously heated by induction.

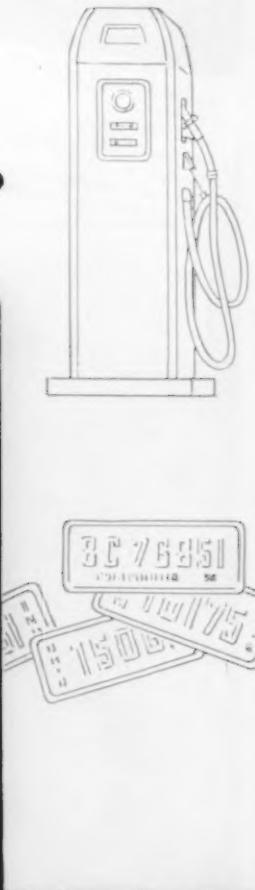
thickened area is again heated in the Tocco coil, a matter of less than one minute. The bar is set on edge in a Williams-White horizontal metal forming bulldozer. Heavy end of the bar is air-clamped to a form block that pivots horizontally as a mating die on the ram of bulldozer advances. The setup is such that the bend must come at the upset, and where the bar rests against a radius at the corner of the form block.

The die is closed, bending the tapered end around the corner radius. As further motion closes the die, its V-shaped recess gives final shape to the forging. Approximately 300 forks are heated and bent per shift. Stretching of the heated metal in bending thins out the upset portion, but thickness remains greater than that of the original bar.

Two forged attaching lugs are later arc welded to the unformed end of the workpiece. Forks are forged close to finished size, although some machining is required.

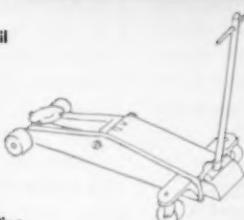
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New Technical Literature:

Catalogs and Bulletins

Tap catalog

A new tap catalog contains data on one firm's equipment in this field. It also includes tables and information on: a standard system for tap marking; major and pitch diameter tolerances available in standard machine screw taps; tap recommendations for Classes 2, 3, 2B and 3B Unified and American Screw Threads; major and pitch diameters for special taps; constants for finding pitch diameters and root diameters of screw threads; and recommended tap drill sizes. *The Wood & Spencer Co.*

For free copy circle No. 1 on postcard, p. 105

Portable lift

A 1-page, 2-color catalog sheet, detailing a new 112-in. telescoping portable lift is now available. The new model, which has a capacity of 1000 lb, is described as featuring a battery powered hydraulic lift. The free literature features both product and operating photographs, together with detail specifications. One section is devoted to the factors that must be considered when choosing a portable lift to fit specific plant operating requirements. *Oster Mfg. Co.*

For free copy circle No. 2 on postcard, p. 105

Hydraulic testers

A line of universal testing machines are presented in a new 12-page Bulletin 4401. Hydraulic machines with capacities from 10,000 to 5,000,000 lb are described, including standard and special types of vertical and horizontal machines. Outstanding feature of the bulletin is described as an illustrated explanation on hydraulic loading and the independent hydraulic weighing system, which is based on the Emery cell and the precise Tate-Emery null-balance load indicator. *Baldwin-Lima-Hamilton Corp.*

For free copy circle No. 3 on postcard, p. 105

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 105.

Flowmeter

Specification Sheet 242-2 describes mechanical flow meters with evenly graduated charts and scales. The meter body, the data states, is a characterized ball float, mounted integrally with the measuring instrument, which forms a self-contained measuring system for pipe stand or panel mounting close to the point of measurement. *Minneapolis-Honeywell Regulator Co.*

For free copy circle No. 4 on postcard, p. 105

Working high speed steels

A new, expanded edition of the Blue Technical Data Sheet on "The Working of Tool and High Speed Steels" is now being distributed. This 16-page Blue Sheet has 17 charts giving detailed information on these steels. Such items as cutting tool angles, table of cutting speeds, temperature ranges and guides are included in the booklet. Heat treating, design, machinability, and other subjects are also treated. *Allegheny Ludlum Steel Corp.*

For free copy circle No. 5 on postcard, p. 105

Oilless bearings, plates

A series of bulletins are available which describe the Metaline group of oilless bronze bearings and plates. Detailed discussion is included on this method of compressing lubricating plugs into drilled holes in the bearing surface. *Spadone-Alfa Corp.*

For free copy circle No. 6 on postcard, p. 105

FREE TECHNICAL LITERATURE

Socket cap screws

A new bulletin giving information on a line of socket cap screws has just been released. The Bulletin, DM737, shows typical installations of cap screws, which the company makes in both Hex and Multiple-Spline sockets, in sizes from #0 wire size to 1½ in. in alloy steel, and #0 to 5/8 in. in stainless steel. *The Bristol Co.*

For free copy circle No. 7 on postcard, p. 105

Lubricator

A 2-page technical reference sheet describing an automatic ratchet-driven lubricator is now offered. The lubricator is described as designed for servicing small machines and mechanisms where installation space is limited and where an oscillating drive is more readily available than rotary motion. The technical reference sheet describes in detail the key features of the lubricator, such as pump cycle, different gear reductions available, reservoir, ratchet drive mechanism and instant feed button. *Bijur Lubricating Corp.*

For free copy circle No. 8 on postcard, p. 105

Rectifier

Standard models of Germanium rectifiers, from 500 to 50,000 amp. capacity, in either forced air or completely sealed water cooled design, are illustrated and described in a new 4-page folder. Available with static magnetic amplifier control for automatic regulated output, these rectifiers are described as having operating efficiency up to 95 pct. *Bart-Messing Corp.*

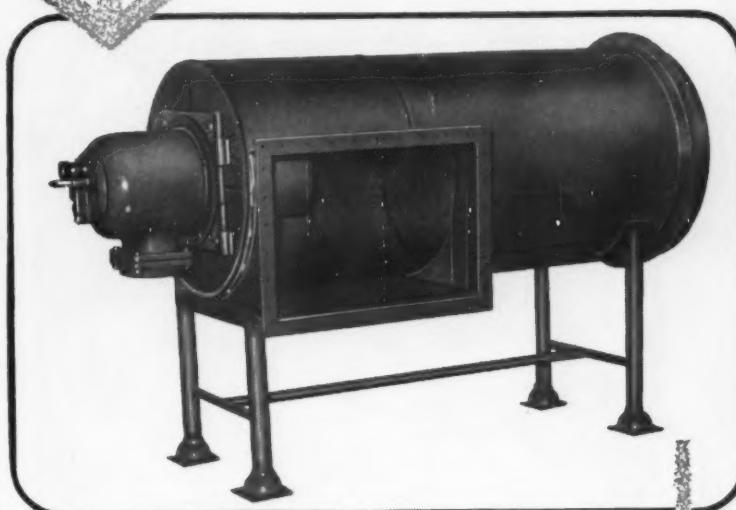
For free copy circle No. 9 on postcard, p. 105

Storage racks

A new illustrated folder describing tiering and storing with portable heavy duty bar racks has just been released. Pictured in the folder are typical stock storage operations with tiering and storing racks using automatic tongs suspended from an overhead crane graphically portrayed. Also shown are the reported advantages of stock checking when racks are tiered neatly in a minimum of plant storage space. *Palmer-Shile Co.*

For free copy circle No. 10 on postcard, p. 105

THERMAL TYPE CA DIRECT FIRED AIR HEATERS



COMPACT . . . EASILY INSTALLED

Readily fitted to ovens, kilns, spray dryers, etc., the THERMAL Type CA Air Heater is an ideal source of heat where products of combustion may be mixed with the air. Oil, gas or combination firing is available without change in heater construction.

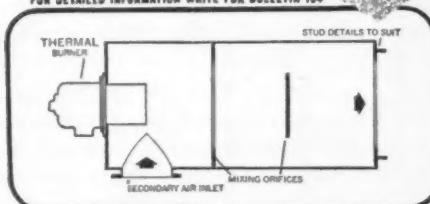
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FOR DETAILED INFORMATION WRITE FOR BULLETIN 104

UNITIZED CONSTRUCTION

Initial cost and upkeep is kept at a minimum through the use of all welded, all metal construction. The CA Air Heaters are normally supplied as complete "package" installations.



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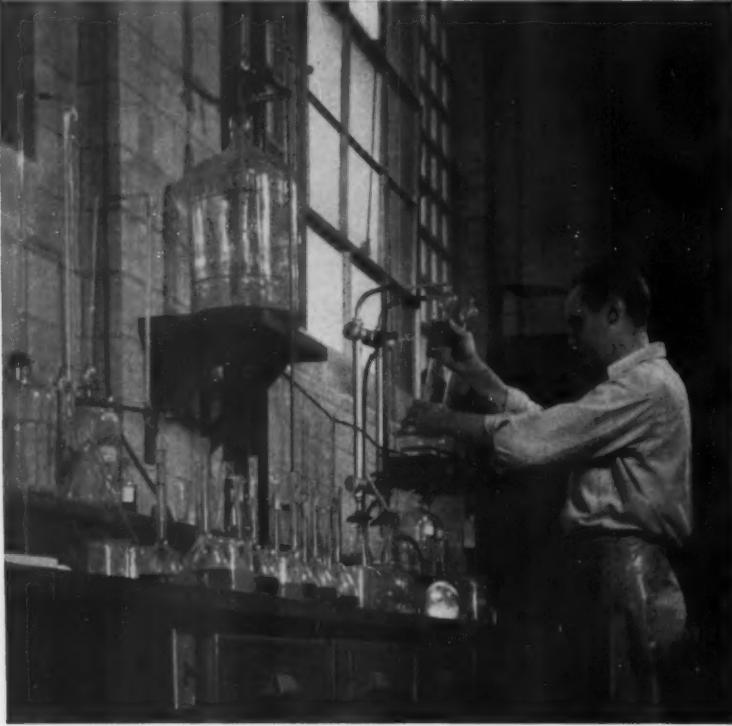
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Cylinders

Information regarding design and materials used in the manufacture of a line of custom-built cylinders is continued in the new 6-page Bulletin 79000. Available for 1500 psi, 3500 psi, or higher pressures, the heavy-duty cylinders illustrated cover a variety of special applications. *Oilgear Co.*

For free copy circle No. 11 on postcard, p. 105

Electric motors

A new line of electric motors is described in a 2-color bulletin just published. The brochure includes photos and information on open drip-proof, as well as enclosed and explosion-proof, electric motors. It offers comprehensive descriptions of the features of these new electric motors, with more than 20 large-sized photographs, including cut-away views, and 10 explanatory technical drawings and graphs. *The Louis Allen Co.*

For free copy circle No. 12 on postcard, p. 105

Steel grade bulletin

A new grade bulletin has been released on the free-machining tool and die steel: Cromovan F.M. The catalog section gives complete information as to typical analysis, characteristics, typical applications, forging, general heat treatment, annealing, hardening, and tempering. *Firth Sterling, Inc.*

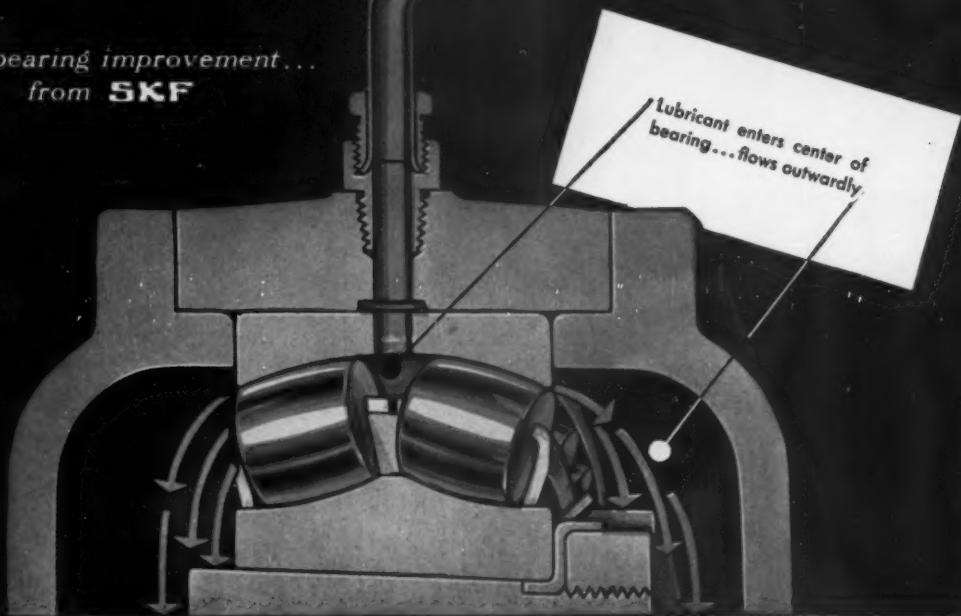
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Laboratory services

Nine case histories of how an industrial laboratory has enabled manufacturers in different fields to develop new products or manufacturing processes are contained in a 12-page brochure, "At Your Service." The brochure describes one firm's research and development facilities which are available to manufacturers of chemicals, pharmaceuticals, powder metal parts, molded plastics, and other products for conducting studies leading to new applications of vacuum drying, vacuum impregnation, and vacuum metallizing, compression and injection molding, and tablet compacting and coating. *F. J. Stokes Machine Co.*

For free copy circle No. 14 on postcard, p. 105

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FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 100

Punch press

Information is available on a new 15-ton punch press which is described as incorporating many safety features. Capable of single-stroking as many as 60 times per minute, the units have been planned to eliminate many of the operating hazards normally encountered, as well as offering high production versatility and less maintenance. *Kenco Mfg. Co.*

For free copy circle No. 15 on postcard

Review of zinc

"A Review of the Zinc Industry in 1955," a new 13-page booklet, has just been published by The American Zinc Institute. The book summarizes the production and consumption picture of the zinc industry as it appeared to be as of December 31, 1955. Tables cover such topics as mine production, imports of slab and ore, tariff rates, slab zinc consumption, zinc uses by grades and production of slab zinc according to grade. Consumption of zinc for die casting, galvanizing, and pigment production is discussed in some detail. Figures are given reviewing stocks of slab zinc on hand at the end of the year. *The American Zinc Institute, Inc.*

For free copy circle No. 16 on postcard

Shape-cutting machine

A new 20-page catalog describing the operating and construction features of an oxyacetylene multiple-torch, shape-cutting machine is now available. Complete information is included covering accessories such as tracers, regulators, gas distribution systems, a Multi-Bevel Unit, cutting torches and tips. *Air Reduction Sales Co.*

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FREE TECHNICAL LITERATURE

Portable nibbler

Literature is available on a 13-lb portable nibbler made for the precision cutting of heavy gage sheet metals (ferrous and nonferrous). The heavy duty unit is described as handling stainless steel of all types up to 10 gage; milder steels and nonferrous metals to 8 gage. The maker states that the nibbler will follow patterns or templates and will cut from any angle. Minimum cutting radius is 6 in. Cutting action is provided by a punch and die which takes a $\frac{1}{4}$ in. slug of metal with each stroke. *Fenway Machine Co.*

For free copy circle No. 20 on postcard

Armed Forces hardware

A 12-page catalog lists and describes hardware for Air, Signal and Engineer Corps transit cases and chests. Diagrams with dimensions are given as well as list designating finishes. *J.H. Sessions & Son*.

For free copy circle No. 21 on postcard

Motor-generator sets

Large pedestal-bearing synchronous motor-generator sets for rolling mills, mine hoists, paper machine drives and other applications are described in a new bulletin. Units covered are available in standard 2-machine sets—200 to 3500 kw output—125, 250 or 600 v, dc; standard 3-machine sets—300 to 7000 kw output—125, 250 or 600 v, dc, and in special combinations to meet special requirements. The bulletin describes various construction features of these generators and motors; portrays typical motor-generator sets; and examples of special combinations used to support metal rolling mill motors. Tables for standard ratings for 2 and 3-machine sets are included in the bulletin as well as motor and generator voltages, special frequencies and special combinations. *Allis-Chalmers Mfg., Co.*

For free copy circle No. 22 on postcard

Switch

Information is available on a new Type-11 switch which, shorter than a paper clip, reportedly maintains precise and accurate snap action and high electrical capacity after 20,000,000 test actuations. The manufacturer states that the Type-11 has outstanding shock resistance: 10 G's to 2000 cycles/sec., and shock 50 G's 11ms. *Licon (R) Switch and Control Div., Illinois Tool Works.*

For free copy circle No. 21 on postcard

Corrosion proofing

A new brochure on corrosion proofing materials and techniques, containing detailed information on cement mortars, interliners for masonry construction and protective coatings and linings for surface treatment, is now offered. The 8-page illustrated booklet contains sections describing one firm's materials for corrosion proof masonry construction and techniques for application based on studies of corrosion-proof masonry installations over periods of 10 to 20 years. Installations surveyed include linings in acid concentrators, stacks, pickling tanks, brick and tile floors for the food processing and chemical industries, as well as sumps, pits and trenches for handling industrial wastes. Tables and charts are provided for selecting proper cement mortars and determining resistance to various corrosive conditions. *Pennsylvania Salt Mfg. Co.*

For free copy circle No. 25 on postcard

Welders

Construction features and specifications for a line of gasoline and Diesel engine-driven industrial dc welders are included in an 8-page folder. The units are available with dual and dual continuous control. *Lincoln Electric Co.*

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Spectrometer

Catalog CH 383 describes a new direct reading medium quartz spectrometer which is reported to perform analyses for up to 11 constituents in two minutes or less with results indicated on a meter or a recorder. The catalog states extensive tests have shown that sensitivity of the spectrometer is high and reproducibility good. It is cited as limited only by the source conditions, homogeneity of the sample, and the intensity of the spectral line relative to the background. *Jarrell-Ash Co.*

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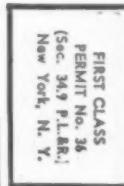
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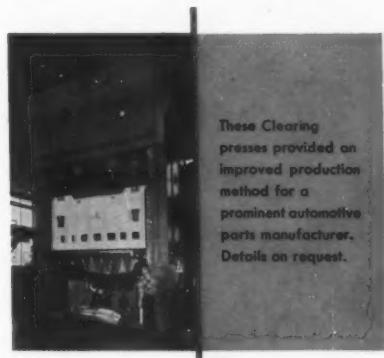
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And if you are at all familiar with the history of Monel in pickling service, it's easy to foresee that this hook will have a long life.

In Monel, excellent physical strength and toughness are combined with unusual resistance to corrosion by the common types of pickling solutions.

Because of this combination, Monel pickling equipment gives many years of service under even the most severe conditions.

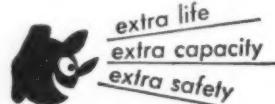
Then after long service, Monel equipment is as easy to repair and recondition as it was to fabricate in the first place.

So look to Monel for minimum dead-weight, maximum life pickling equipment. And look to experienced de-

signers and fabricators like Youngstown Welding and Engineering Company to help you realize to the fullest these values of Monel in pickling service.

For information on other pickling uses of Monel, write for the Inco booklet, "5-Way Savings in Pickling."

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TECHNICAL BRIEFS

MACHINING: Unit Speeds Output

Vertical multiple-spindle hydraulic automatic completes 26 operations on both ends of iron flywheel in 43 seconds . . . Cross slides said to give versatility and flexibility.

A new vertical multiple-spindle hydraulic chucking automatic—manufactured by the National Acme Co., Cleveland—is described as performing 26 operations to complete both ends of a cast iron flywheel in a single machine set-up. Elapsed time of the operation is reported as 43 seconds.

The unit—first of a series—is equipped with 14-in. capacity chucks, eight turning slides and four cross slides. In addition, four "auto cross slides" can be operated on the vertical turret at one time to provide greater tooling adaptability for production machining of large forged and cast workpieces. A six-spindle, model equipped with 17-in. capacity chucks, six vertical turning slides and four cross slides also will be available.

Cross Slides Complement

The cross slides complement the vertical end-working slides and are said to provide flexibility and additional tooling operations heretofore not available in a single machining setup in these capacities. Because the independent cross slides of the chucker are mounted on the lower frame and actuated from cam drums located directly beneath them, they are described as providing maximum support for the heaviest forming cuts as well as cross-facing or necking operations on the surface of the piece.

Standard spindle speed range is 32 to 628 rpm. Three spindle speeds are available at each spindle position with each set of pick-off gears providing speeds for various cutting requirements.

Positive indexing of the spindle carrier is by an independent indexing motor with hydraulically-

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 105. Just indicate the page on which it appears. Be sure to note exactly the information wanted.



Both ends of flywheel are machined in total time of 43 sec.

operated locking and clamping at completion of index. Changeover from single to double index (or vice versa) is accomplished quickly by the removal or addition of a cam on the indexing tappet shaft.

The electro-hydraulic system provides a means of actuation and control, while also enabling a number of electrical, hydraulic and mechanical interlocks to be embodied as safety devices to protect both machine and operator.

Functions performed hydraulically include: opening and closing of chucks; engaging and disengaging clutches in the spindle drives; applying brakes at the loading stations; providing a reverse motion of the carrier to bring it back against the locating catch after indexing, then actu-

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TECHNICAL BRIEFS

ating a wedge to hold the carrier in that position; and clamping the carrier during cutting.

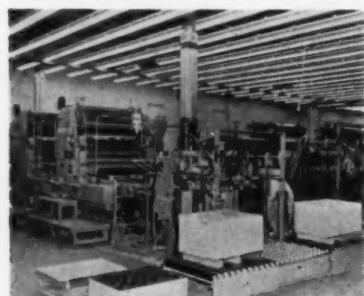
Machine controls are conveniently located near the loading station and are duplicated at the rear for ease in setting up. A master timing cam drum controls the completely automatic machining cycle, operating switches for the entire electrical circuit including the electro-hydraulic circuits.

Design of the machine is based upon that of Thomas Ryder and Son, Ltd., Bolton, England, combined with National Acme's experience to adapt it to American standards of performance.

Handling:

High-speed feeders aid processing tin plate.

Several materials handling ideas to keep tin plate in constant readiness for high-speed feeders have been combined at Crown Cork and Seal Co., Inc., in its new lithography plant at Philadelphia. These feeders—built by the Dexter Folder Co., Pearl River, N. Y.—deliver sheets to the coaters and lithography presses which apply the designs that are found on canned products.



Use of "stand-by" bundles aids in tin plate handling.

While tin plate is one of the heavier items handled in quantity throughout industry, Crown Cork has now made plate handling an almost effortless operation and solved the problems of manipulating the heavy loads at processing machines.

Stand-by bundles are kept in readiness on conveyor sections

In a matter of seconds, this small packet of Foote Rimex will intensify the rimming action in each ingot of molten rim steel. Result—ingots with a thick skin of high-quality steel relatively free of blowholes. Ingot growth is minimized...higher quality is assured without obnoxious, toxic fumes. No wonder Rimex is widely used for producing rim steels that meet rigid quality requirements for modern deep drawing operations.

Rimex is one of the specialized additives developed by Foote to meet the needs of the steel industry. Whether you need a new type of steel additive or are interested in the standard additives, it will pay you to contact Foote.

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FOOTE MINERAL COMPANY

438 Eighteen W. Chelten Bldg., Phila. 44, Pa.

RESEARCH LABORATORIES: Berwyn, Pa.

PLANTS: Exton, Pa.; Kings Mountain, N.C.; Sunbright, Va.

which flank a ball-transfer loading station. This arrangement avoids the extension of a lengthy conveyor-section into the general plant area.

Flat-Surface Skid Used

To move skid-loads onto the ball-transfer table and then at right angles to the conveyor-platform of the feeder's elevator, a flat-surface skid support had to be provided. Therefore, as each skid is deposited, it is placed on a metal sheet which enables the load to be moved freely and smoothly onto the ball table and thence to the feeder platform.

Another innovation of this installation is the insertion of vertical strips between storage-conveyor rollers to provide leverage for iron bars which workmen use to nudge the 4200 lb loads forward.

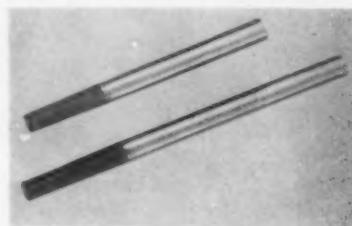
As soon as one bundle is delivered to the feeder it is replaced with another, assuring an ample supply at all times. The Dexter

feeder is designed so new bundles may be loaded before the old bundle is depleted, thus enabling continuous operation as long as stand-by tin plate is available.

Coating:

Flame-plating with tungsten carbide extends drill life.

Excessive down-time of machines used to drill holes in acoustical tile proved to be a troublesome bottleneck to one tile manufacturer. The tile material is extremely abrasive and wears



Drills, for tile working, are flame-plated to increase life.

even tool-steel drills very rapidly. This meant that the entire drilling operation had to be shut down frequently while drills were replaced. This costly problem was solved by flame-plating the outside surface of the tubular drills with a 0.002 in. coating of tungsten carbide. The flame-plated drills make up to 200,000 holes before they have to be replaced—more than 50 times the number of holes previously possible.

Flame-plating parts and tools with tungsten carbide is a process service developed by Linde Air Products Co., a Div. of Union Carbide and Carbon Corp. Finished parts can be coated with tungsten carbide without distortion for the temperature of the part being flame-plated seldom exceeds 400°F. As most metal can be flame-plated, Linde says, the design engineer can now combine the hardness of tungsten carbide with the metallurgical advantages of the base metal.



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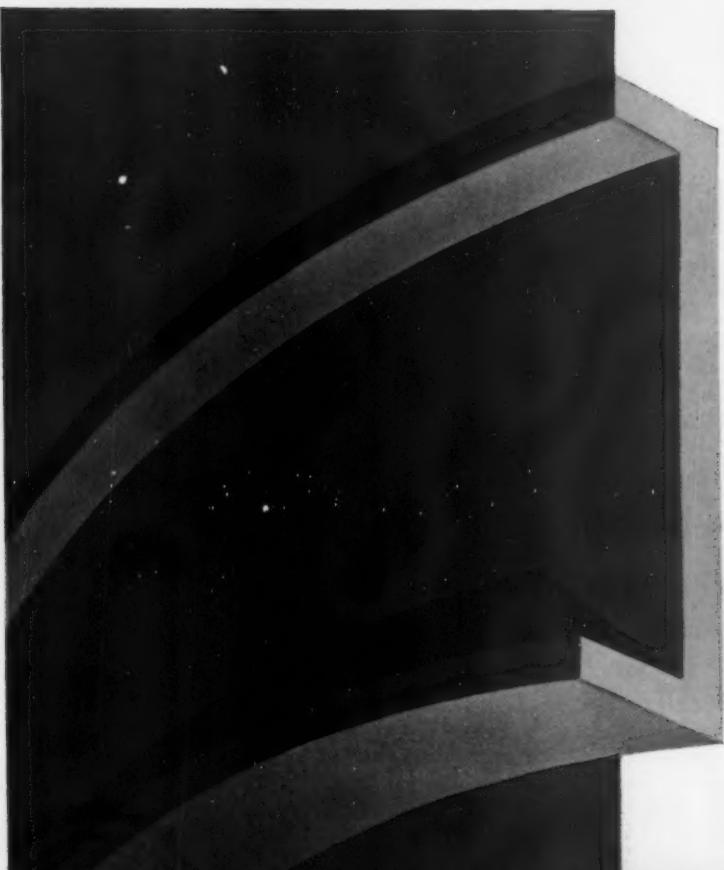
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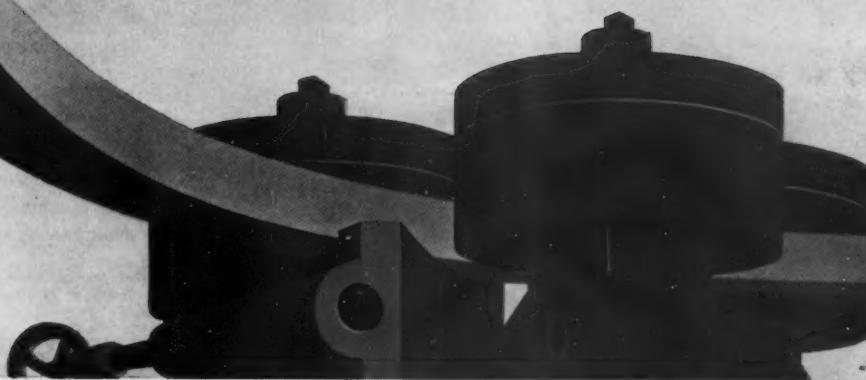
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TECHNICAL BRIEFS

Testing:

Army summarizes cold chamber test facilities in U. S.

Operation in arctic and subarctic areas is becoming increasingly important to the military and industry alike. Although field tests are the final criteria, cold chamber investigations normally precede them. Until now, there has been no summary available on facilities of U. S. low temperature test chambers.

This gap recently was closed by the Corps of Engineers, Research and Development Laboratories, Ft. Belvoir, Va. Through questionnaires and physical inspections of the various sites, it has compiled a handbook of characteristic sheets for government project engineers, contracting officers and others. The sheets include chamber measurements, temperature ranges, humidity and altitude provisions, auxiliary test equipment available and other pertinent facts.

Special emphasis was placed on chambers equipped for low temperature test (to -65°F) of engine-powered equipment. In addition to physical facilities, the study considered problems in preparing and servicing engine-powered equipment for low temperature tests. Practical safety precautions needed also are listed.

Heat Treating:

Use of mechanized handling speeds tube normalizing.

Fully automatic mechanized heat-treating equipment is used for continuous normalizing of small sizes of oil well tubing by the National Supply Co. in its Spang-Chalfant Div. plant in Ambridge, Pa.

The equipment includes three small furnaces, instrumentation for heat control by automatic regulation of valves in gas lines to burners, and automatic, variable-speed conveyors for handling the tubing between charging table

and cooling table. Approximately 1000 tons of tubing per month are normalized on a 20-turn per week schedule. One man operates the equipment.

Conveyors Outside Furnaces

A feature of equipment design is the minimum use of high alloy steel in the conveyors. This was achieved by placing all conveyor rollers outside of the three furnaces. Furnace conveyors consist of 4 water-cooled high-alloy rollers between and at the entrance and exit ends of the three furnaces. Inlet and outlet conveyor tables each have seven powered rollers.

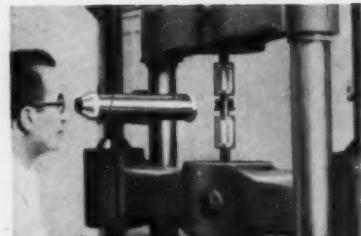
By using the company's own engineering staff and recovering handling equipment formerly used in pipe threading operations for conveyors and pipe racks the total cost was held to a minimum. The new equipment was installed to meet increasing demand for N-80 grade oil well tubing which is made of steel having a yield strength of 80,000 lb per sq in.



Heat treat for normalizing is arranged for operating ease.

The normalizing line consists of three gas-fired furnaces, each 4 ft long and having four gas burners. The first two furnaces are used for heating the tubing and have burners of 1,000,000 Btu per hr capacity. They are automatically controlled at 2500°F to heat the pipe body to 1650 deg and the upset to 1600 deg. The third furnace is used for soaking and has four burners each of 750,000 Btu per hr capacity which are controlled at 1650°F .

Only two sizes of tubing are



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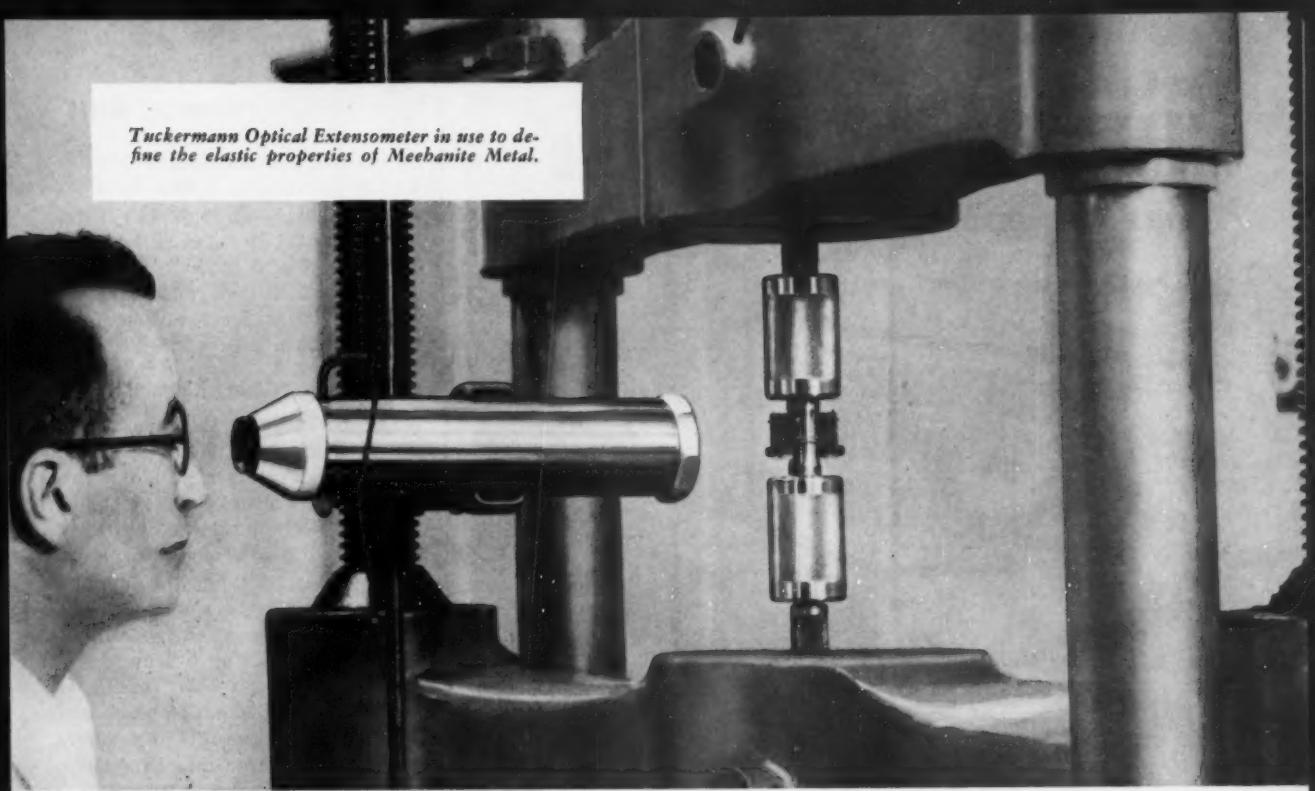
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Write today to Meehanite Metal Corporation, Dept. 1A, 714 North Avenue, New Rochelle, N. Y.

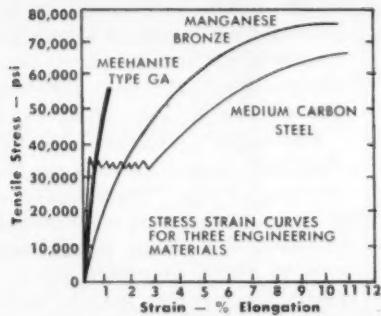
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THE IRON AGE

Tuckermann Optical Extensometer in use to define the elastic properties of Meehanite Metal.

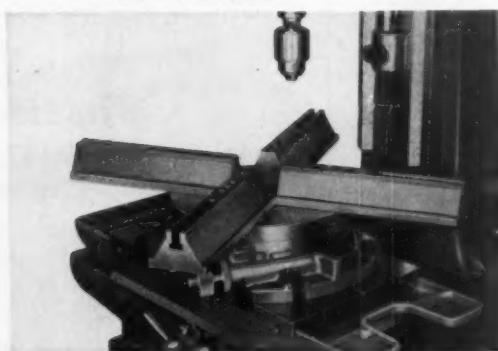


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The data also demonstrates that true elasticity persists up to loads approximating one-third of the tensile strength of the metal. Design with confidence. Specify Meehanite Metal for your casting requirements. For additional information, write for Meehanite Design Data, Bulletins No. 26 and No. 27 today.



High modulus with resistance to elastic deformation is important in these Meehanite extension parallels where maintenance of required dimensions is essential.



Dimensional stability and high resilience of Meehanite Castings is typified in this Wales Hole Punching unit. The superior stiffness of Meehanite Metal permitted units to be made with 8", 12" and even 16" throats.

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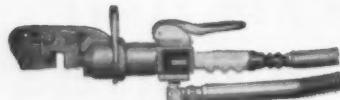
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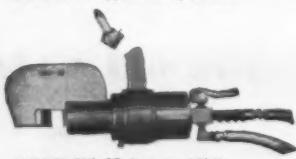
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MODEL MC 35 Capacity 1" Cuts high carbon material including reinforcing rod and heat treated chain to 1" diameter in $1\frac{1}{4}$ seconds per cut.



MODEL MC 65 Capacity $1\frac{1}{4}$ " Cuts $1\frac{1}{4}$ " diameter steel in 2 seconds per cut. Can be modified to cut $1\frac{1}{8}$ " diameter aluminum.

These Guillotine units powered by Manco Hi-Thrust Electric Hydraulic Pumps

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MANCO MFG. CO., Bradley, Illinois

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Please send:

- Catalog of new Guillotine Wire and Rod Cutters.
 Trade-In Information on Guillotine model(s).

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TECHNICAL BRIEFS

normalized in this line: $2\frac{3}{8}$ -in. x 4.70 lb and $2\frac{7}{8}$ -in. x 6.50 lb. The former moves through the furnaces at about 10 ft per minute. A speed range of 5 to 20 ft per minute, controlled by rheostat settings, provides for heat treating the other size.

Normalizing Capacity Up

The normalizing line operation is automatic except for keeping the charging table supplied with tubing by overhead crane and similarly removing the tubing that accumulates on the cooling table. On the charging table, the tubing rolls by gravity to a stop where automatic air-operated selective kick-in arms pick up a length of tubing and roll it onto the furnace inlet table. The kick-in switch is operated by a paddle over which the preceding tube has passed. The tubing is conveyed through the furnaces by the four rolls at the ends of the furnaces, then on to a furnace outlet conveyor. There is another automatic kick-out paddle switch at the end of the outlet conveyor. When depressed by a length of tubing the air-operated kick-out arms discharge the length onto the cooling table.

The new equipment has increased normalizing capacity for all sizes of pipe. The removal of 500 tons of small tubing from two roll-down type tube normalizers has, in effect, increased the capacity of normalizing in these roll downs by 1000 tons of $5\frac{1}{2}$ -in. x 23-lb casing.

Casting:

New aluminum casting alloy contains less nickel

A new aluminum casting alloy which is relatively unaffected by nickel shortages has been announced by Aluminum Company of America.

Designated as F132, the new alloy was developed primarily to replace an older automotive piston alloy, D132, which has a higher nickel content. Since an emergency would quickly curtail the



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TECHNICAL BRIEFS

use of nickel, F132 offers a more dependable material.

Properties Identical

Properties of the new alloy are virtually identical to D132, according to Alcoa's Development Division. Extensive test runs in a representative group of automotive engines proved F132 pistons would operate equally well.

The nickel content of D132 alloy has a range from 0.5 to 1.5 pct. Alloy F132 has a 0.5 pct nickel maximum.

In addition to a difference in nickel content, the composition limits for F132 alloy permit 1.0 pct maximum zinc, rather than the 0.50 pct maximum for D132. Elevated temperature testing and engine testing of pistons indicate this higher zinc limit will not adversely affect performance characteristics.

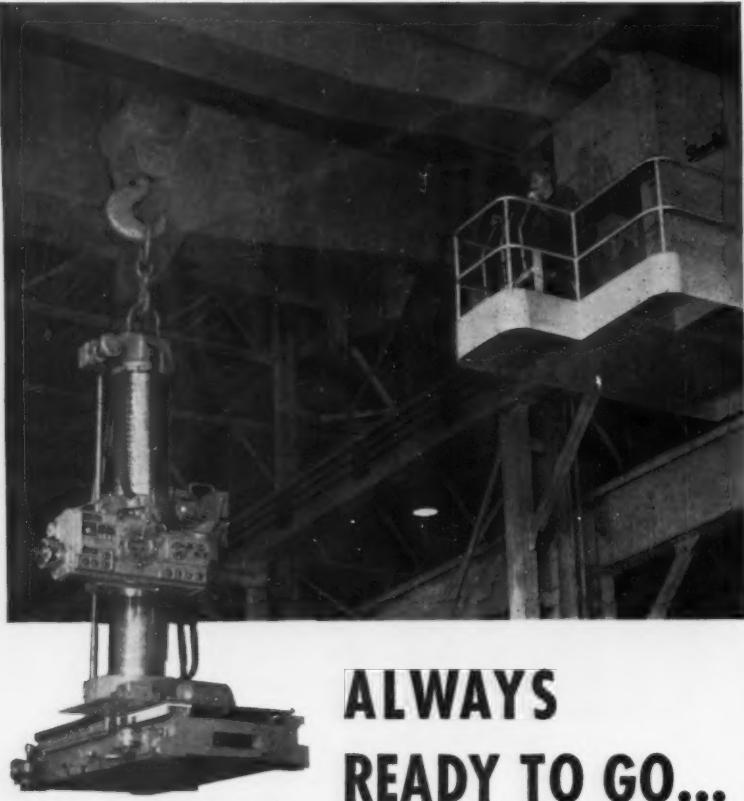
Planing:

Cutter completes operation without tool resetting

Rough, semi-finish and finish planing of steel and cast iron—without resetting a single tool and with only one slide positioning—is reported now being performed on a universal planer using special tools fitted with Kennametal Grade K21 tips and inserts, manufactured by Kennametal, Inc., Latrobe, Pa. The combination process consists of rough planing on forward and return strokes while finish planing during the forward stroke.

Mounted back-to-back in a special swivel-type holder with three degrees negative back rake and an equal amount of positive side rake, two heavy-duty Kendex style SDH-42 square button inserts were employed in a typical operation, along with a broad nose finishing tool. The latter, which is mounted on a conventional continental style tool box, has three degrees positive back rake and 45 degrees negative side rake.

Both tools, using K21, cut SAE 1025 steel and 175 Brinell cast iron billets—4 x 7 x 28 in.—with-



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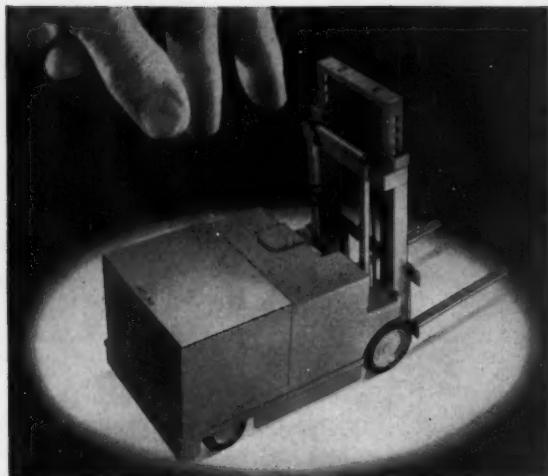
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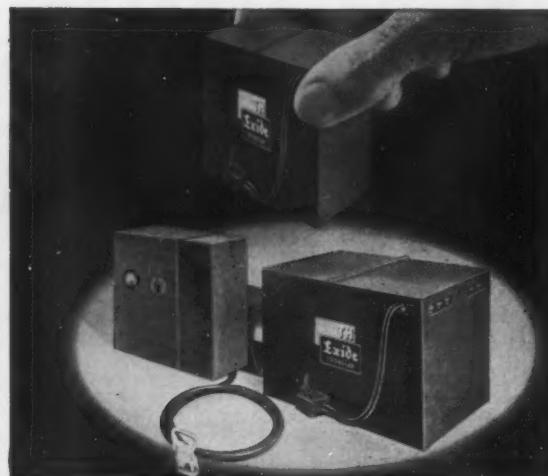
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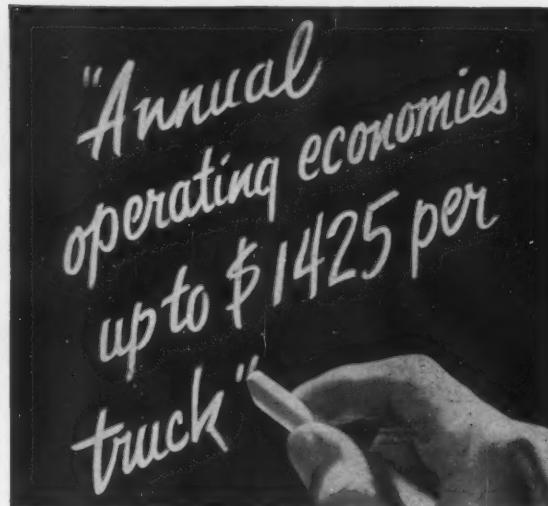
YOU BUY ONLY THE TRUCK CHASSIS. Choose any make of battery-powered electric industrial truck. Buy one truck or an entire fleet.



LEASE POWER PACKAGE FROM EXIDE. You receive famous Exide-Ironclad Batteries, plus the charger. Monthly cost is surprisingly low.



SAVE UP TO 33% CASH OUTLAY. This new Exide leasing plan brings initial cost for electric trucks down within range of trucks using any other kind of power.



PAY BATTERY LEASING COSTS OUT OF OPERATING ECONOMIES. Exide-powered electric trucks cost less to own and operate. Savings are tremendous!

SAVE UP TO 33% CASH OUTLAY ON ELECTRIC TRUCKS

New Exide leasing plan points the way to lower materials handling costs

Look how many ways Exide-powered electric industrial trucks can save you money just through operating economies: no wasted power when the truck is stopped; faster handling of materials; no unscheduled downtime; no high repair bills. *Added safety feature*—no bothersome fumes or noise. You pay for Exide power as you use it—the same as with other forms of power. But electric trucks give you over twice the operating life. Additional shifts multiply the economies.

Now you can have all these advantages at a new low initial investment—through the Exide leasing plan. And you get famous Exide-Ironclad heavy duty batteries with the unique positive plate.

Electrolyte flows easily through slotted power tubes to reach more active material faster. Result: an Exide-Ironclad delivers more power quicker for a longer time at lower cost.

Get all the facts and figures on how the Exide leasing plan can meet your particular requirements. Call your Exide sales representative. Talk with any electric truck salesman. Send the coupon.

Exide

Send for
complete
details



Exide Industrial Division
The Electric Storage Battery Company
Phila. 2, Pa.

Send me details on the new plan for cutting cash outlay on electric trucks.

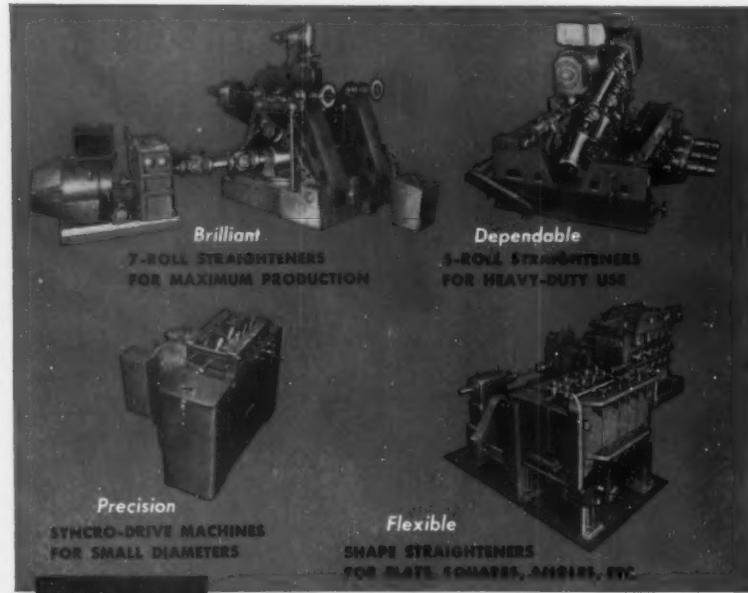
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**TUBES
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MODERN
METALS**

Today, as in the past, leading mills specify Sutton for the finest straightening available.

Standard or special model straighteners can be furnished for almost every application. Quality of end product, high speed production and dependability of operation are assured by our forty years of straightening experience.

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SUTTON *Engineering COMPANY*

Manufacturers for Ferrous and Non-Ferrous Metal Industries

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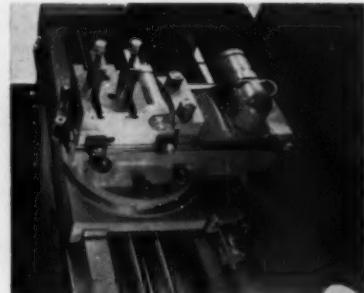
TECHNICAL BRIEFS

out modification of grind or cutting angles.

Steel cuts were made at 300 sfm, 0.078-in. feed and $\frac{3}{8}$ in. depth of cut. Cast iron cuts were made at 0.156-in. feed and 0.010-in. depth of cut. The cutting speed was reduced to 200 sfm to prolong tool life of the steel cutting inserts.

Placed In Two Rows

The steel and cast iron work-pieces were placed on the planer in two rows with two pieces in



Three-in-one planing operation achieved without tool resetting.

line in each row, providing intermittent cutting conditions. Approximately one cubic foot of steel and cast iron is removed with each corner of the square Kenedex insert or a total of 4 cu ft per regrind. The broad nose finishing tool is mounted, according to Kennametal, so as to provide the roughing tool a $\frac{1}{2}$ -in. lead, allowing the semi-finish cut to be made on each forward roughing stroke. For a better finish, the tool slide can be lowered a few thousandths of an inch to plane a new surface without interference from the roughing tool.

Heat Treating:

Nitriding process recommended for wear-resistant surfaces

A new process called Supercase for the nitriding of stainless steel is announced by Standard Steel Treating Company, of Detroit. Supercase is described as especially adaptable for use on parts where an extremely hard, wear-

The PROOF of the STEEL is in its PERFORMANCE

*DSC Welded Wire Fabric Puts
a Steel Backbone in Reinforced
Concrete.*

Here's a section of 120" LO-HED reinforced concrete pipe. You can see how big it is from the trucks and pipe storage yard in the background.

What you don't see is the DSC Welded Wire Fabric embedded in the concrete. It gives the pipe a steel backbone, makes it strong and durable.

For the very same purpose DSC Fabric goes into modern reinforced concrete turnpikes and landing strips—just to mention two of many common uses.

Our Portsmouth Division "weaves" DSC Fabric.



Courtesy Lamar Pipe & Tile Div., American Marietta Corp.

The "threads" consist of Portsmouth Bright Basic Low Carbon Reinforcing Wire. The "warp and woof" intersections are spot-welded electronically.

Here, job-performance is the ability of the Fabric to resist estimated stresses and strains. It depends on sound welds and conformity to size, gauge and physical requirements.

Whether it's Rod, Wire, Sheet or Strip—DSC Steelmanship is the same. Ask your nearby DSC Customer Representative.

Customer Satisfaction Is Our No. 1 Job



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Hot Rolled and Cold Rolled Sheets • Hot Rolled Strip
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Aluminum Cable Strand Reinforcement • Rope Wire • Tire Bead Wire
Welded Wire Fabric

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ON READY-TO-USE Job-Fitted SHEET AND STRIP

COLD ROLLED STEEL STRIP: Coils • Cut Lengths • All tempers

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THE STAMPING
INDUSTRY

Adv. Courtesy DSC

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TECHNICAL BRIEFS

"Fills requirement for hard surface parts requiring maximum corrosion resistance . . ."

resistant surface with maximum corrosion resistance is needed. The process has been used by electronics, carburetor, transmission, aircraft and small parts manufacturers.

Depths Controlled

Supercase has the following reported advantages:

Depths are controlled to closer limits. Because a more uniform, extremely hard case, is obtained by this process, only a very light case is required. Normal case depth using this process ranges between 0.0003 to 0.0007 in., yet wear tests on small gears nitrided by this method proved they outlasted, by several times, the life of the unit in which they were to be used.



Parts which have been nitrided by the new "Supercase" process

THE SAVINGS in assembly time alone are

reason enough, in many cases, for switching to @

Special Fasteners. In addition, production economies, better design or a more durable product can improve your position in a competitive market.

WHATEVER RESULT YOU ARE LOOKING FOR, your chances of getting it are better when you use special @ fasteners.

WHETHER THEY ARE ENGINEERED from your rough sketch or designed in your own shop, you will find Buffalo Bolt most cooperative in helping you get the most for your dollar. Find out by contacting any one of our offices.

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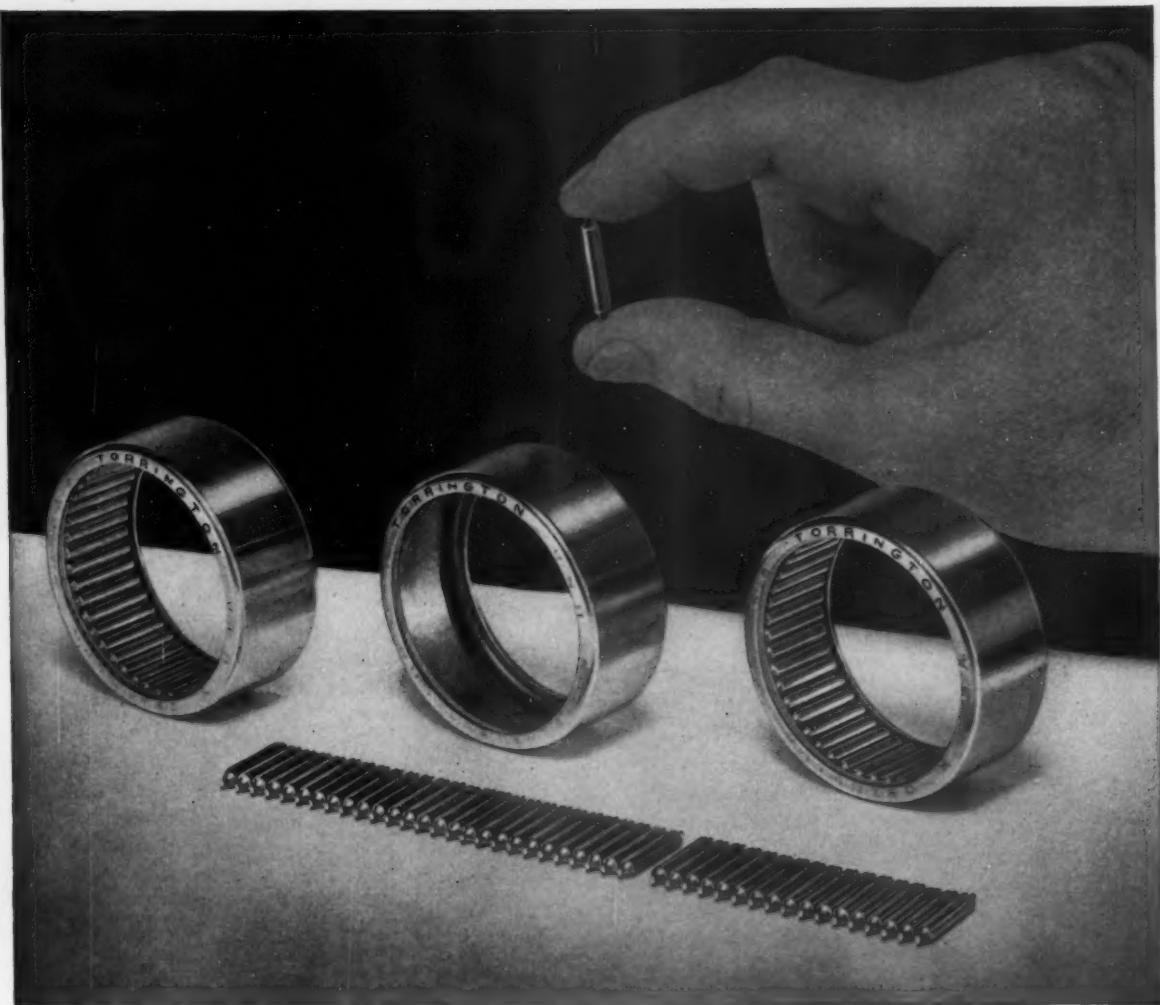
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can be made BETTER
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SPECIAL
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Here's where the **TORRINGTON** **NEEDLE BEARING** gets its precision

This Needle Roller is the "work horse" of the Torrington Needle Bearing. Its jewel-like precision is the key to smooth performance of the Needle Bearing. That's why in every manufacturing step—from alloy selection to final polishing—the rollers are checked against strict quality controls.

A full complement of Needle Rollers, mounted in a precision-made, case-hardened retaining shell, provides a maximum number of contact lines, giving the Torrington Needle Bearing a higher radial load capacity than any other bearing of comparable size.

The Torrington Needle Bearing delivers top anti-friction performance—with low coefficient of both starting and running friction.

For more than twenty years, our Engineering Department has helped designers and manufacturers throughout industry to adapt the unique advantages of the Needle Bearing to their products. Let us help you make the Needle Bearing "standard equipment" in yours.

See our new *Needle Bearing Catalog* in the 1956 *Sweet's Product Design File*—or write direct for a catalog.

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TORRINGTON BEARINGS

Needle • Spherical Roller • Tapered Roller • Cylindrical Roller • Ball • Needle Rollers



TORRINGTON NEEDLE BEARINGS

Give you these benefits

- low coefficient of starting and running friction
- full complement of rollers
- unequalled radial load capacity
- low unit cost
- long service life
- compactness and light weight
- runs directly on hardened shafts
- permits use of larger and stiffer shafts

**GUILLOTINE BEAM WEB PUNCH**

Six individually controlled punching units with automatically synchronized punch and die, facilitate setting up to various gauge lines. 33" max. setting to outside units; 2½" min. setting between units. 200 ton cap.

GUILLOTINE BEAM FLANGE PUNCH

A turn of a handwheel changes punching centers and synchronizes punch with die. Four punching units, with 2¼"-6¾" setting between inside and outside punches, adjustable 2¼"-3½". 200 ton cap.



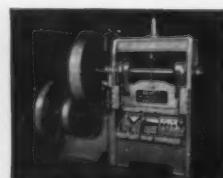
BEATTY Spacing Table handles web and flange punching without roll adjustment.



BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.



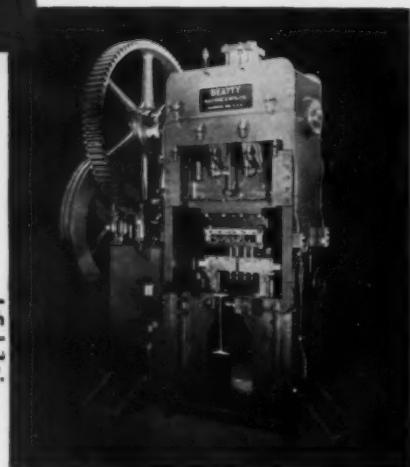
BEATTY Gap Type Press for forming, bending, flanging, pressing. 250 ton cap.



BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.

FASTER WEB and FLANGE PUNCHING

Beatty Built-in Adjustable Tools Save Set-up Time



REDUCE COSTS ON "SHORT-ORDER" PUNCHING

Take the high costs out of "short order" punching with these versatile BEATTY Guillotine Beam Punches. They're especially designed to reduce costs in handling short run web and flange punching where punching arrangements are frequently changed.

Incorporating entirely new time-saving adjustable tools that eliminate expensive setting up time, reduce down time . . . these BEATTY machines have lowered costs by as much as 75% on some metal fabricating jobs.

Dependable, accurate fast . . . BEATTY machines (standard models or custom-built to your specifications) can help solve your metal fabricating problems—reduce costs. Talk it over with a Beatty engineer!

New Films:

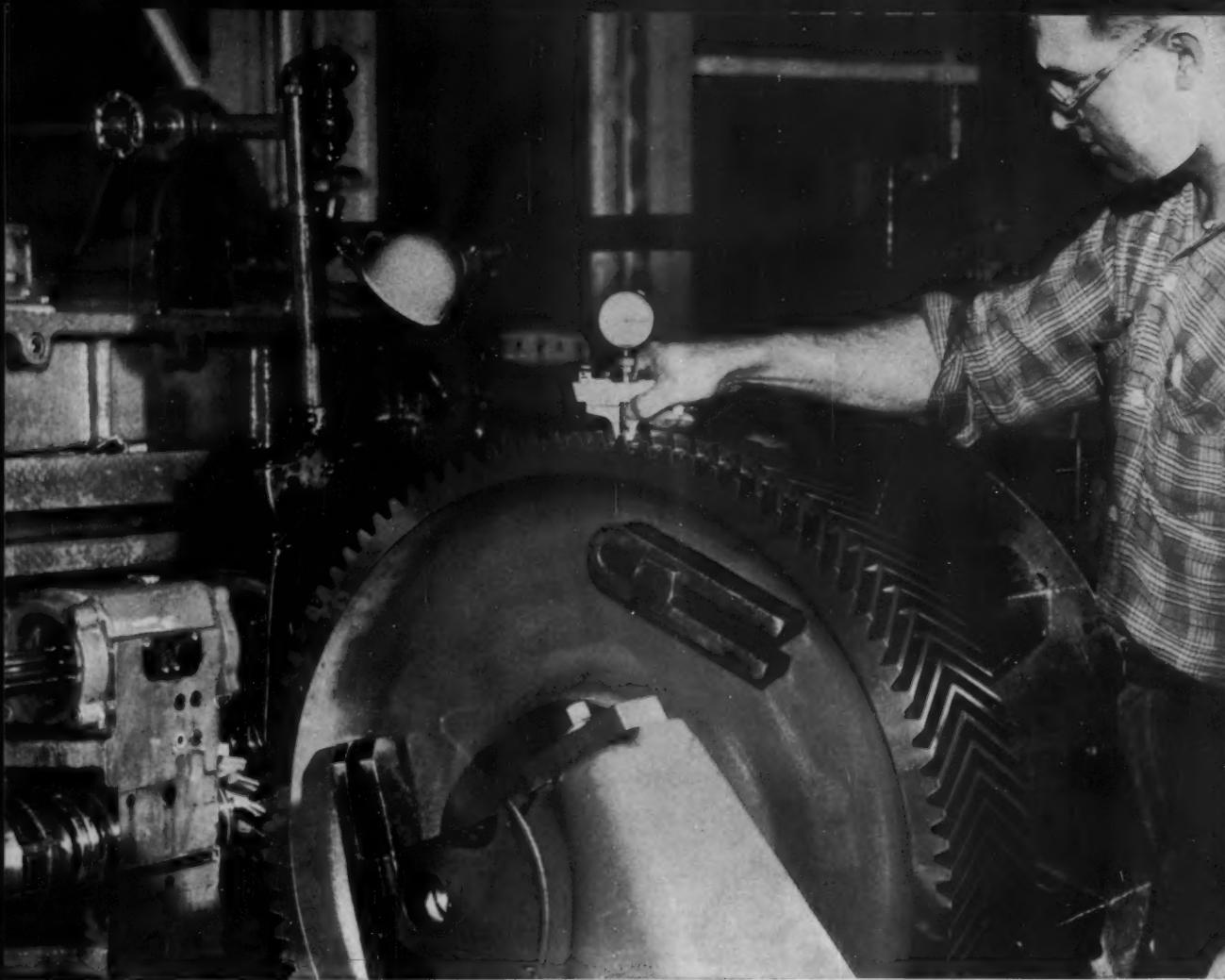
"Tools of Abundance" is a 28 min., 16 mm, color and sound film which describes, in story form, the basic functions of design engineers, process engineers, tool engineers, tool grinders, machine operators and purchasing men. It does this by following through an actual case history on the development of a new product from beginning to end. Wesson Co., 1220 Woodward Heights Blvd., Ferndale 20, Detroit.

"To Enrich Mankind" is the title of a 25 min., 16 mm, color motion picture prepared by ASME "to explain to the public the significance of the role mechanical engineering plays in the development of our country." The film story is developed around the characters of Archimedes and a museum caretaker named Gus. While Gus is setting up an exhibit of machines a statue of the Greek scientist comes to life. He shows Gus how mechanical engineers have contributed to progress by making possible the myriad devices we use today. Public Relations Dept., American Society of Mechanical Engineers, 29 W. 39th St., New York 18.

"U. S. Multi-Slides for the Production of Stampings," is a 22 min., 16 mm, sound film in black and white which describes and illustrates the features of construction of U. S. Tool Co. Multi-Slide machines for the production of stampings. Request film on your company letterhead to U. S. Tool Co., Inc., Ampere, (East Orange), N. J.

"The Allen Story," 25 min., color, is a motion picture showing the development and application of threaded fastenings from their earliest use in Greek and Roman times right up to the present. It concentrates on hex-socket set screws, cap screws, and other hex-socket fasteners. Advertising Dept., Allen Mfg. Co., Hartford 2.

BEATTY
MACHINE & MFG. CO.
HAMMOND, IND.



Checking teeth pitch on 32" O.D. gear at the Philadelphia plant of Link-Belt Company.

speed up machining, extend cutter life with Standard Steel forged gear blanks

By switching to Standard Steel forged blanks for the helical and herringbone gears used in their enclosed drive units, the Philadelphia plant of Link-Belt Company has speeded up machining time and lengthened cutter life substantially. That's because:

- Dimensional tolerances are closer, so all gear blanks of the same size can be machined on a single setup.
- Standard Steel forged blanks have no blow holes, porosity or non-metallic inclusions, so finish turning, facing, boring and hobbing can be done faster.
- High speed cutters last much longer because these forgings have a more uniform internal structure.

Link-Belt's experience in reducing costs is typical of hundreds of other manufacturers. When you specify Standard Steel forgings, you get a product that is quality-controlled from start to finish. We produce our own acid open hearth steel, heat treating and tempering it carefully.

Finished forgings are carefully inspected and checked to assure meeting customer specifications.

In addition to gear blanks, Standard Steel can furnish you with rings, flanges, shafts, wheels and special shapes—and furnish them fast. Next time you need forgings, get our quotation first. For a copy of our new bulletin, write us at Burnham, Pennsylvania.



STANDARD STEEL WORKS DIVISION

BALDWIN-LIMA-HAMILTON

DIVISIONS: Austin-Western • Eddystone • Lima
Electronics & Instrumentation • Hamilton • Pelton
• Loewy-Hydropress • Madsen

New Films:

"*Pressure on Metalworking Production*," has a running time of 25 minutes and is a 16 mm, color and sound movie which demonstrates the role of hydraulic presses in forcing metal into a desired shape. Action shots of installations illustrate the use of hydraulic presses for stretch-forming, cold extrusion, flanging, forging, drawing and forming. The differences between single, double, and triple action presses are illustrated by animated sequences. *Lake Erie Eng. Corp., Box 68, Kenmore Station, Buffalo 17.*

"*The Chemistry of Aluminum*," is a 16 min., 16 mm motion picture in sound and color, which explains the mining and purification of bauxite for production of alumina. Designed primarily for college classroom use, it also covers the electrolysis of alumina in molten cryolite for the making of metallic aluminum, as well as the production of chemicals such as hydrated, calcined and activated aluminas. It reviews present-day uses for aluminum and explains production techniques for casting, rolling, extruding and deep drawing of the metal. *Motion Picture Dept., Reynolds Metals Co., 2500 S. Third St., Louisville 1.*

Two New Catalogs Answer Your Needs For Door Efficiency



KINNEAR Steel Rolling Doors

— with the coiling upward action of interlocking steel slats (originated by Kinnear) — are illustrated and described here in every detail. Also complete data on Kinnear Steel Rolling Fire Doors (labeled by Underwriters' Laboratories, Inc.) and the upward-acting Kinnear Steel Rolling Grilles, the attractive steel-bar-and-link protection that admits light, air and vision. Full details on Kinnear Motor Operators, too!



All about KINNEAR Rol-TOP Doors

— the better-built, sectional-type doors of either wood or all-steel construction. Available with provision for glass in any number of panels. Full range of sizes for residential, commercial and industrial needs. Also details on motor operators and controls!

Send today for these handy FREE reference books on space-saving DOORS!

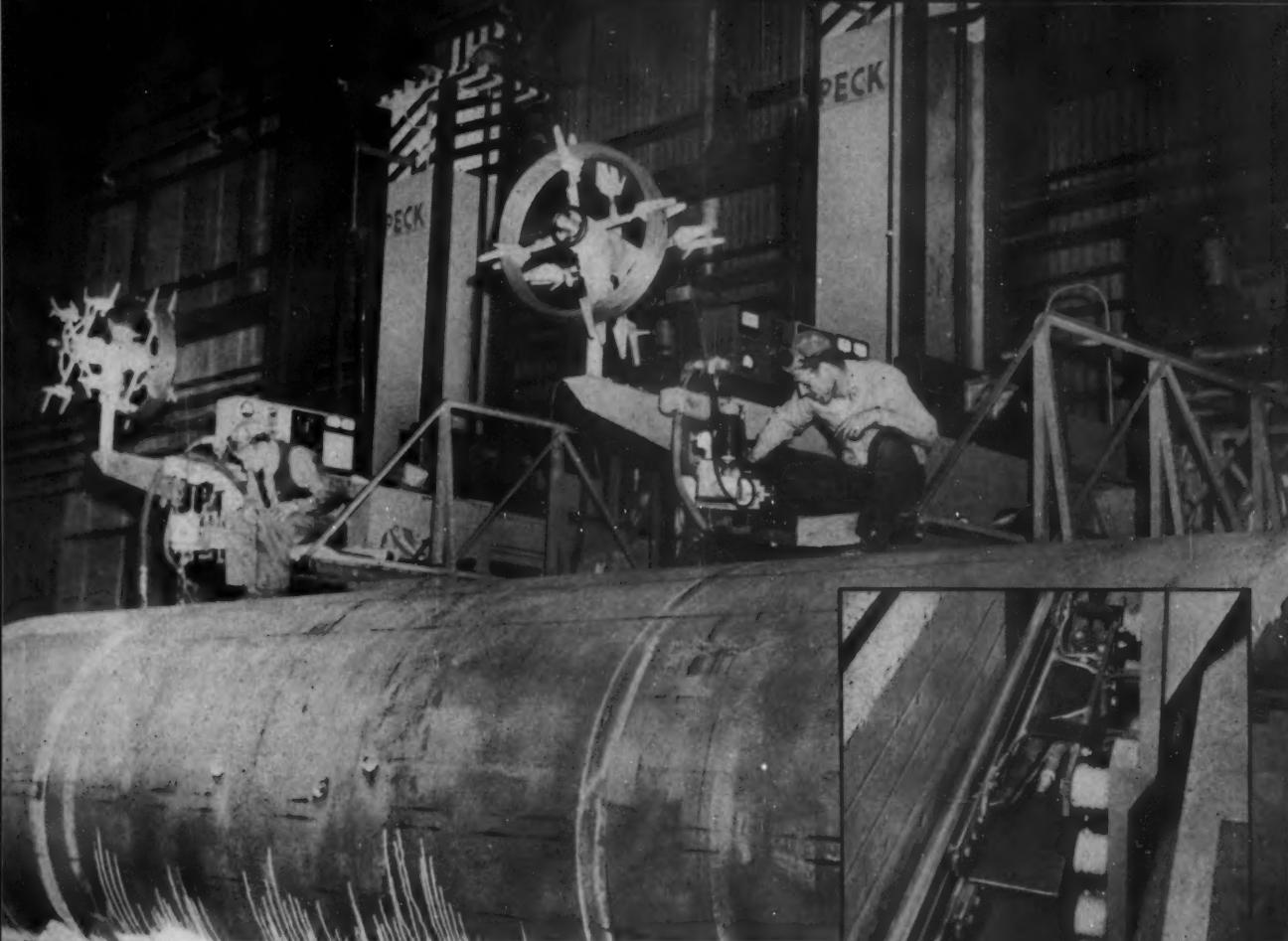
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KINNEAR
ROLLING DOORS

The KINNEAR Mfg. Co.

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TANDEM WELDING HEADS in operation on heavy pressure vessel at Foster Wheeler Corporation.



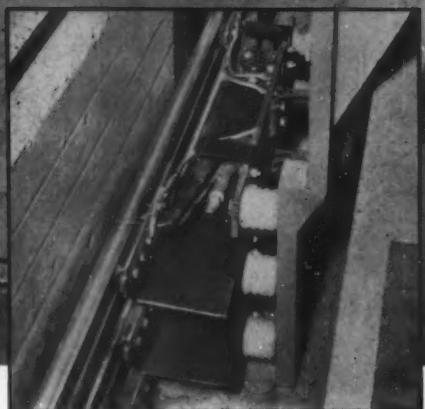
Clears the Deck for Action

Integrated Aluminum Conductor System Powers Automatic Welders Safely, Efficiently

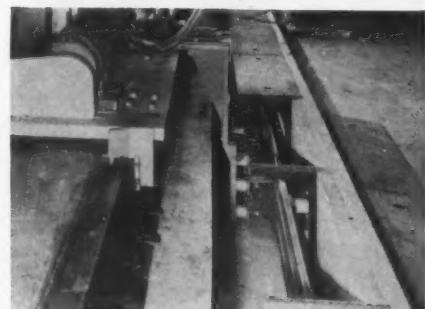
FOSTER WHEELER'S streamlined welding equipment gets much of its efficiency from the KEYSTONE Aluminum Conductor System that powers it. Hazardous cables are eliminated; this promotes safety and prevents interference which might cause hesitation or vibration—and thus an imperfect weld on the pressure vessel.

Welding generators may be completely mobile (as in this case) or stationary. Full welding current can be conducted where needed; conductor lengths have been installed up to 360 ft., can be longer. There's no limit as to length of rails or amperage handled with KEYSTONE Aluminum Conductor Systems.

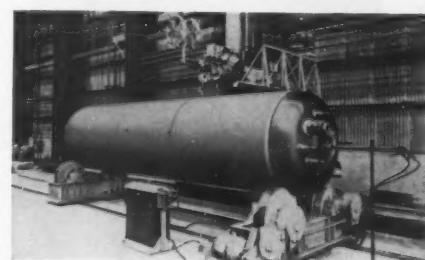
IMPORTANT NOTE: This application is only one of many in all types of industries. It may suggest a power distribution method in your plant. Write for "Case Histories" on Keystone Aluminum Conductor Systems."



VERTICALLY STACKED conductor rails with collectors running at right angles. This system operates at 675 amps, 440 volts.



RECESSED POWER source with safety plates removed to show side mounted aluminum conductors and collectors.



ROTATING CRADLE and moving welder permits horizontal and circular welding. Behind cradle is KEYSTONE Aluminum Conductor System.

KEYSTONE ELECTRIC SERVICE MANUFACTURING CO.

Philadelphia 32, Pennsylvania

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 105 or 106.



Horizontal and vertical miller handles large parts

Special 3-way, horizontal and vertical milling, drilling and tapping machine is reported as handling 70 lb transmission housings at a production rate of 50 units per hr. at 100 pct efficiency. The indexing fixture is mounted on standard drill head, 6-station, automatic index table. It positions the part so

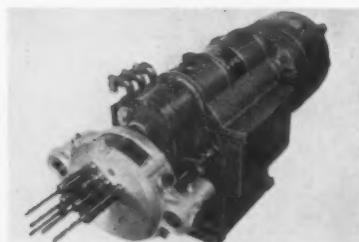
that all machining operations are performed in either a vertical or a horizontal position rather than an angular one. The machine is described as lending itself to retooling by use of standard components. Power clamping is provided on the fixture. *Michigan Drill Head Co.*
For more data circle No. 27 on postcard, p. 105



Coil loader designed to cut down time

Power-lift coil loader has been developed to reduce the downtime for re-loading coil stock to a minimum. Built of rugged construction for long operating life, it can be loaded whenever cranes are not busy. Lateral movement is described as easily obtained for loader, as it is

mounted on rails to permit freedom for loading of coil. Complete coil movement, in both lateral and vertical directions, is by electrical power and is push-button controlled. Unit can be built to handle multiple coils. *Sesco, Inc.*
For more data circle No. 28 on postcard, p. 105



Drill unit has capacity from wire sizes to 1/2 in. steel

Self-contained, high speed automatic drill unit has a capacity ranging from wire sizes to $\frac{1}{2}$ in. in steel. It has an electric relay system which controls the cycle and the drill depth, while a hydraulic system controls the rate of spindle feed and prevents over-

travel at the bottom of the spindle stroke. Drill depth can be set to less than 0.005 in. within the 3 in. maximum stroke. Also the rate of feed can be positioned from zero to the maximum the drill will stand. *Ettco Tool Co.*

For more data circle No. 29 on postcard, p. 105

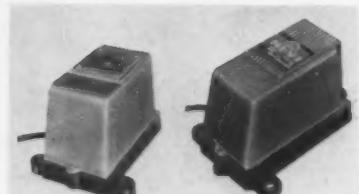


Bar cutter and bar bender are portable

Portable units for bar cutting and bar bending (shown) are constructed of OH steel plate, are fully enclosed, and have all drive parts made of special alloy steel. The bar cutter has a rapid return of the knife for a return stroke which is

reported as three times faster than the cutting stroke. The long stroke enables the machine to cut thin bars without change of knives. It will also cut wire in bundles. *Klingelhofer Machine Tool Co.*

For more data circle No. 30 on postcard, p. 105



Vibrators impart rhythmic action to bins and hoppers

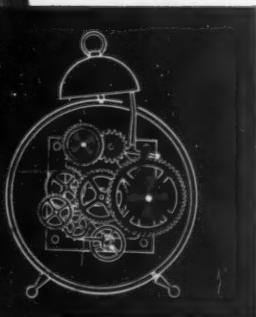
By combining a permanent magnetic unit with an electro-magnet operating on ac current, a manufacturer has perfected unit vibrators which operates at 3600 vpm. They transmit a rhythmic action

to bins, hoppers or chutes handling dry materials in lump or powdered form, to assure a free and dependable even flow at all times. *Eriez Mfg. Co.*

For more data circle No. 31 on postcard, p. 105



For Years of Repeat Performance



specify
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SPRING STEEL

Sandvik Steels have a record of success in applications which demand years of consistent, continuous performance.

In products such as clock and watch springs, compressor valves, piston ring springs, vibrator reeds . . . wherever fatigue life is vital, you'll find Sandvik untiring in service.

If your product requires high fatigue life, fine surface finish, uniform physical properties and accurate gauge, try Sandvik.

You can get Sandvik strip steels:

- In special analyses for specific applications.
- Precision-rolled in thicknesses to fit your requirements.
- In straight carbon and alloy grades.
- Annealed, unannealed or hardened and tempered.
- Polished bright, yellow or blue.
- With square, round or dressed edges.
- Wide range of sizes in stock—also slitting facilities available.

Ask your nearest Sandvik office for further information or technical assistance.



FREE SANDVIK CATALOG:
Give thickness, width,
hardness, type of edge and
weight in pounds per hundred
feet. Write for your copy.

SANDVIK SWEDISH SPECIALTY STRIP STEELS
are used for Textile Machine Parts such as sinkers,
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and Expanders • and many other applications

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Electronic device controls solution conductivity

Designed for simplified operation, a new conductivity unit has been planned for use where the need for recording is not required. It is equipped with two zone action for both alarm or control. A single set-point knob on the front provides control within the range of the instrument calibration. The instrument is available in two

standard ranges of conductivity: 0 to 30 micromhos/cm 3, or 20 to 200 micromhos/cm 3, for use with conductivity cells having a constant of one. The scale calibration is non-linear and provides maximum readability at high specific conductivities. *Robertshaw-Fulton Controls Co.*

For more data circle No. 22 on postcard, p. 105

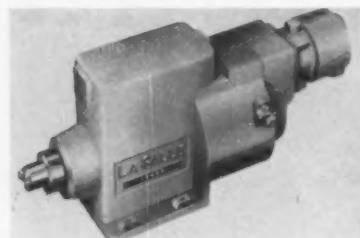


New belt drive for plating line eliminates gearing

Two Neoprene cogged V-belts combined with two cogged drive-pulleys for positive transmission of power without gearing are described as the latest in plating barrel development. The belts, having woven steel tensile members for greater strength, are reported

as non-stretchable. The coating is designed to give resistance to acids, alkalies and floating oil or grease. The belts constant-mesh with cogs in drive pulleys (inset) to insure no slip, creep or speed variation. *G. S. Equipment Co.*

For more data circle No. 33 on postcard, p. 105

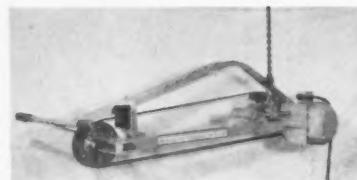


Automatic power wrench has controlled torque

A two-speed, fully automatic power wrench with controlled torque can be synchronized with machine cycle for automatic engaging and disengaging of parts. In addition, the controlled torque feature is described as eliminating the guesswork in clamping pres-

sure. The wrench has automatic lubrication and fluid motor drive. Two standard sizes are available: a small model (torque capacity 0-800 in./lb) and a larger (torque range 800 in./lb to 5000 in./lb.). *LaSalle Tool, Inc.*

For more data circle No. 34 on postcard, p. 105



Abrasive grinder may be lathe or bench mounted

This universal abrasive belt grinder can be used as a standard belt swing grinder and lathe mounted off the back cross slide for polishing and precision grinding of cylindrical parts. In addition, it may

be bench mounted for contact wheel grinding and for contour polishing. The unit is manufactured in 1½, 2, 3, 5, 7½ and 10 hp sizes. *Abrasive Machinery Corp.*

For more data circle No. 35 on postcard, p. 105



New gasket cutter is made available

Built with a lightweight, durable phenolic body with steel blades, and inch and metric scales for extreme accuracy is a new gasket cutter. The unit cuts round gaskets ¼ to 6 in., and odd shapes

and straight pieces any size. It is recommended by the manufacturer for cutting diaphragms, disks, gaskets, patterns and shims. *Cincinnati Tool Co.*

For more data circle No. 36 on postcard, p. 105



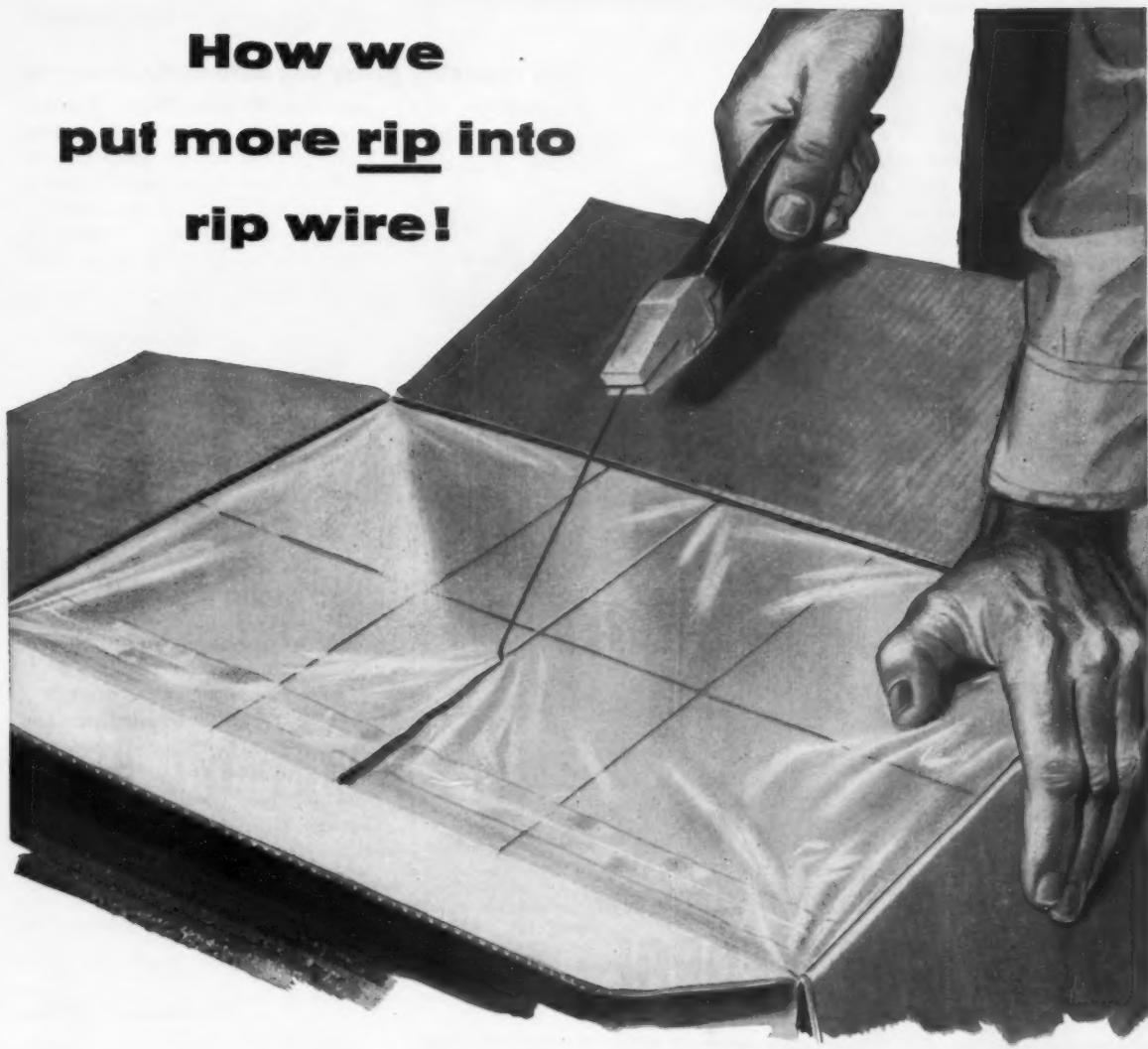
Materials handling buggy has automotive type drive

Incorporating automotive type drive and instantaneous direct shift from forward to reverse, a new materials handling power buggy is described as capable of operation by anyone who drives a car. It is said to have good maneuverability, being able to turn around within a radius of its own

length; back instantly when necessary; or be safety-lock braked on any grade while carrying maximum load. Its maximum travel speed empty is stated as 17 mph. It is heavily powered and climb-loaded rated at 1450 lb on a 35 pct grade. *Creative Metals Corp.*

For more data circle No. 37 on postcard, p. 105

How we put more rip into rip wire!



● Industry often wraps its products in heavy paper to protect it from damage due to moisture, handling and other causes. To make these packages or bundles easier to open, Worcester Wire Works has developed a special rip wire for inclusion in the wrapping.

To get even greater protection, some products are wrapped in plastics rather than paper. And this caused a problem. Ordinary rip wire wouldn't cut the tough plastic.

Our Worcester Wire Works Division solved the problem by developing a special rip wire with a knurled surface that literally put teeth into the wire. It cuts through

the toughest plastic coating as easily as a buzz saw.

Not all of the problems we solve for industry have such simple solutions. Often, we are called upon to develop steel and wire with completely new characteristics . . . to combine seemingly incompatible factors or properties. And quite frequently these are developments that other manufacturers have given up on.

If you have a problem calling for special development work in steel or wire . . . either in creating a product or finding new and better ways to make or use it . . . it will pay you to write or call National-Standard.



NATIONAL-STANDARD COMPANY • NILES, MICHIGAN

Tire Wire, Stainless, Fabricated Braids and Tape

ATHENIA STEEL DIVISION • CLIFTON, N. J.

Flat, High Carbon, Cold Rolled Spring Steel

REYNOLDS WIRE DIVISION • DIXON, ILLINOIS

Industrial Wire Cloth

WAGNER LITHO MACHINERY DIVISION • JERSEY CITY, N. J.

Special Machinery for Metal Decorating

WORCESTER WIRE WORKS DIVISION • WORCESTER, MASS.

Round and Shaped Steel Wire, Small Sizes

NEW EQUIPMENT

Adjustable wrench

Called the Auto-Grip, an 8½ oz crescent type wrench has a forged aluminum handle and steel lower jaws with an insert steel lip. The push button product is made in four sizes: 6 in., 8 in., 10 in. and 12 in. In the 8-in. model, for example, the wrench is reported to be easily adjusted up to 15/16ths of an inch by light pressure. *BMS Enterprises.*

For more data circle No. 38 on postcard, p. 105

Need Large Hydraulic Cylinders?



BUILT TO REQUIRED SIZES AND TOLERANCES BY

TITUSVILLE FORCE



Hydraulic cylinders combining the advantages of thoroughly hot worked steel and clean automatic welding are being furnished by Titusville. Such cylinders insure the user of better physical characteristics (hollow forged shell and flanged sections together with upset forged top or dome sections), freedom from leakage under pressure because of porosity and the complete elimination of costly repairs or rejections. Fabrication is shown in photos above.

1. Hollow forging for shell section being hot worked on mandrel.
2. Hollow and upset forgings assembled for automatic welding.
3. Complete welded cylinder being rough turned in 80" engine lathe.

Let Titusville Forge build your hydraulic cylinders—to your most exacting requirements.

STRUTHERS WELLS CORPORATION

TITUSVILLE FORGE DIVISION

TITUSVILLE, PA.

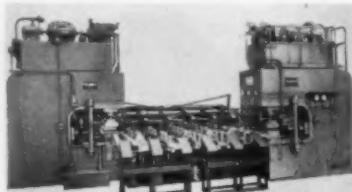
PLANTS AT TITUSVILLE, PA., and WARREN, PA.

Offices in Principal Cities

S
truther
S
Wells

Tube reducing press has automatic features

Fully automatic in operation, this press removes a piece of tubing stock from a loaded magazine,



positions the piece before it enters the machine, carries it into 3-stage work station where reducing operations are performed, removes the finished tube and deposits it in tote box. Designed to reduce the two ends of 2 in. diam x 0.062 wall steel tube from 2 in. to 1¼ in. *American Steel Foundries.*

For more data circle No. 39 on postcard, p. 105

Groove checking gage

A high precision, Swiss-made instrument is designed to simplify the job of checking internal groove depths. The device is said to offer unusual versatility, having a capacity of ⅜ in. to 6 in. in diam. A large meter-type face offers easy readability and is graduated in 0.0005 in. The unit gives accurate 3 point checking for production runs, or 2 point checking for single units and short runs. It comes equipped with short and long groove tips, button tips for hole checking special flat bottom tips, centering arms, special socket wrench and screwdriver in a wooden case. *Portage Double Quick Tool Co.*

For more data circle No. 40 on postcard, p. 105

Hydraulic miller

Called the 3-D Hydro-Cycle Miller, this unit is described as milling left or right, forward or back, and up or down and cutting circles to within 0.002 in. tolerance. The



unit has a hydraulic spindle with speed ranges of from 200 rpm to 2500 rpm, with infinite speed selection. *Romulus Tool & Eng.*
For more data circle No. 41 on postcard, p. 105



25,680,000 PARTS PRODUCED with ONE TALIDE DIE

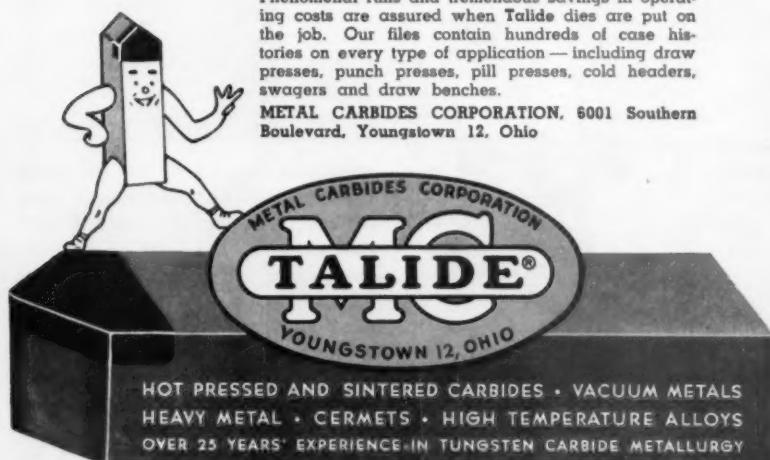
A large electrical equipment manufacturer was having difficulty maintaining production of electrical outlet boxes. Die costs were high, downtime and scrap excessive. It was necessary to remove and repolish the hi-carbon, hi-chrome die every 60,000 pieces. Total production secured from each steel die averaged 700,000 pieces.

After an initial survey, our die engineers designed and installed a Talide die using Grade C-88. Operation is performed on a 75-ton double action Bliss press. Original die was put in operation 3 years ago and is still going strong, having been removed only once for repolishing — after drawing 15,000,000 pieces!

Total production obtained to date has reached the astounding figure of 25,680,000 outlet boxes — 36 times more production than when using a steel die. The Talide die costs \$1,125.00 compared to \$500.00 for each steel die. Savings in die cost alone has amounted to over \$18,000.00 over the past 3 years, with substantial additional savings realized in increased production. Downtime, repolishing cost and scrap expense were completely eliminated.

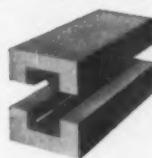
Call in a Talide sales engineer for recommendations on how to solve your particular die problem. Phenomenal runs and tremendous savings in operating costs are assured when Talide dies are put on the job. Our files contain hundreds of case histories on every type of application — including draw presses, punch presses, pill presses, cold headers, swagers and draw benches.

METAL CARBIDES CORPORATION, 6001 Southern Boulevard, Youngstown 12, Ohio



VISIT OUR BOOTH 1300

A.S.T.E. TOOL SHOW, CHICAGO, ILL.



SWAGING DIES
Leading Fountain Pen Manufacturer cold swages 33 times more stainless steel parts with TALIDE dies.



HEADING AND EXTRUSION DIES
Cold-heading 1/4". C-1008 steel rivets, TALIDE dies produced 11,200,000 pieces, other carbide dies only 3,500,000.



CURLING ROLLERS
TALIDE Curling Rolls last 65 times longer than steel rolls on beverage can forming operation.



BLANKING AND FORMING DIES
70 times more paper discs blanked out with TALIDE — over hard alloy die.



SHEET METAL DIES
137,000 hi-alloy steel Pressure Vessels drawn with TALIDE, against only 7,700 with steel dies previously used.



POWDERED METALLURGY DIES
Compacting highly abrasive chemical powders, TALIDE Pill dies last 4 months, steel dies wore out in 6 hours.

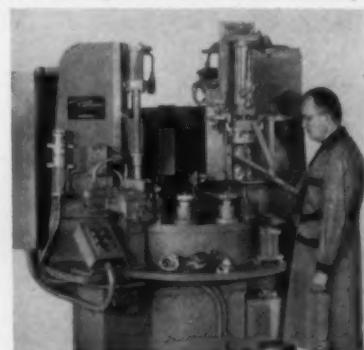
Drum handling attachment

A new rotating drum handling attachment of 2000 lb capacity has been developed which is mentioned as particularly effective where quick horizontal placement or stacking is a materials handling requirement. Its ability is described as due to the design of its rubber coated clamp arms. *Yale & Towne Mfg. Co.*

For more data circle No. 42 on postcard, p. 105

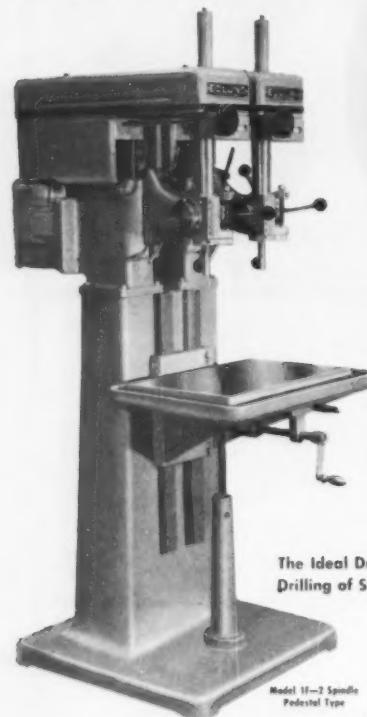
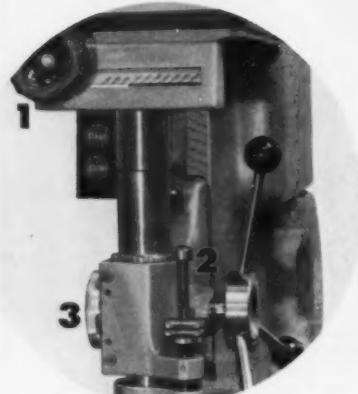
Eight-station machine assembles parts automatically

Feeding, positioning, assembling and removal of parts are described as all done automatically with this eight-station assembly machine. The parts consist of a needle bearing, a washer and a seal which are assembled in an automotive steering gear end cover. Parts are automatically fed and positioned from indexing machines, while the completed assembly is removed and



placed on a conveyor automatically. Production rate is reported as 720 completed assemblies per hr. *Omer E. Robbins Co.*

For more data circle No. 43 on postcard, p. 105

EDLUND
MODEL 1F
*Infinitely Variable Speed
10,000 R.P.M.*
**Sensitive Drilling Machine****1 INFINITELY VARIABLE SPEED CONTROL**

Simply turn knob for any speed within range of the machine. Swift, powerful, and positive action.

2 MICROMETER GRADUATED DEPTH GAUGE

Permits accurate pre-set depth control for all precision production drilling. Clearly graduated to .001".

3 ADJUSTABLE SPINDLE TENSION CONTROL

Compensates for different drilling conditions. Three handle feed lever reduces worker fatigue.

The Ideal Drilling Machine for High Speed Sensitive Drilling of Small Parts, Light Assemblies, and Instrumentation.

Model 1F-2 Spindle Pedestal Type

SPECIFICATIONS
Overhang Capacity (Cast Iron)
2" Morse Taper or Jacobs Chuck
Speed Range — Optional
625 to 10000 RPM
1750 to 10000 RPM
Spindles — 1 to 6
Pedestal and Bench Types

Send for Free Illustrated Bulletin 2160

EDLUND
MACHINERY COMPANY Cortland, New York
Division—Precision Casting Co., Inc.—Subsidiary—Hamburg Steel Corporation

America's
Most
Popular
Drilling
Machine

Model 1F-1 Spindle Bench Type

EDLUND REPRESENTATIVES IN MAJOR CITIES

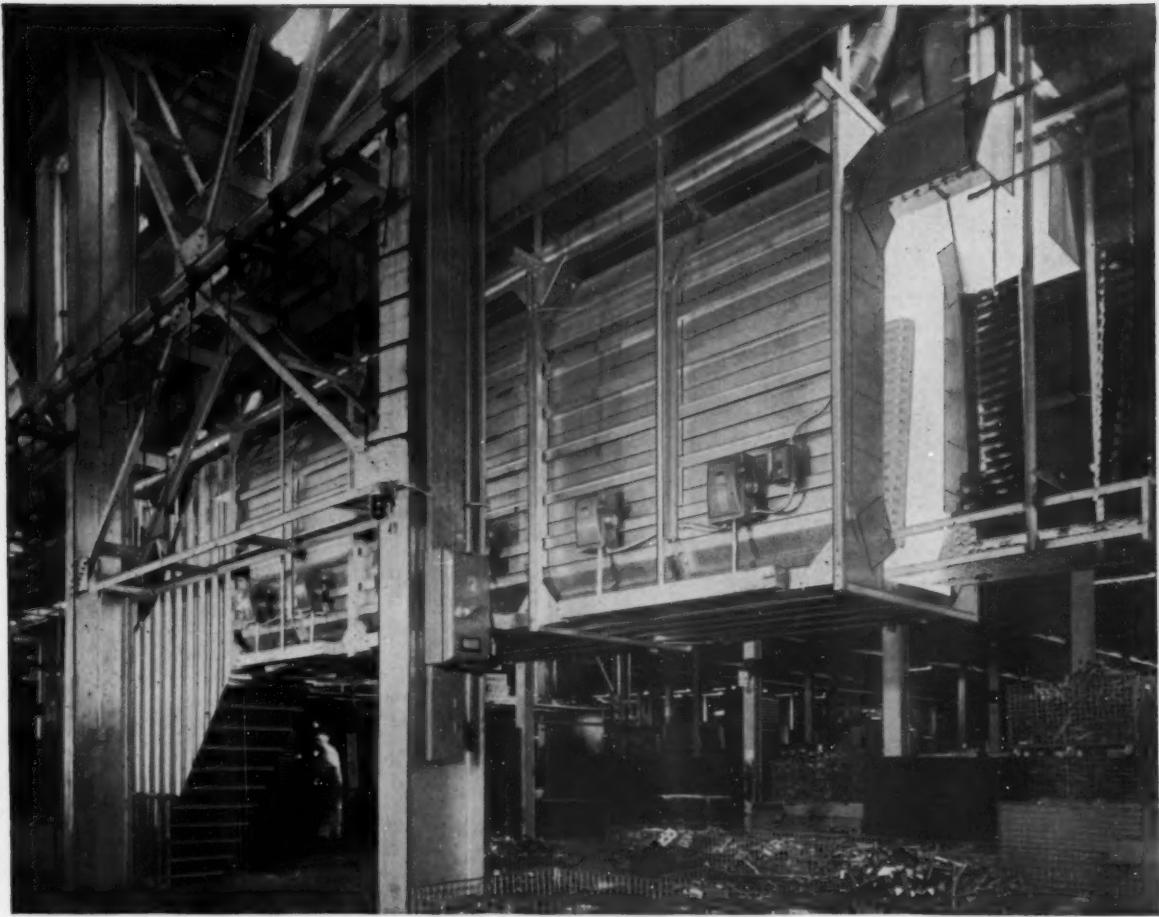
Atmosphere generator

Compact unit combines a gas-fired endothermic generator with an automatic dew point recorder-controller. By this interlocking the prepared atmosphere gas is described as controlled within a narrow dew point range by automatic regulation of the air/gas ratio to the reaction tube. The result is described as a continuous, fully



automatic control of the prepared base gas analysis under such conditions as changing humidity and variations in analysis and pressure of the line gas. Need for manual adjustments and periodic dew point checks are reported as eliminated. The unit is available in standard sizes ranging from 750 to 5000 cfm. *Ipsen Industries, Inc.*

For more data circle No. 44 on postcard, p. 105



Fostoria Radiant Oven at Westinghouse, Columbus, Ohio

PROCESSES 24,000 PARTS EVERY WEEK

It takes only 15 minutes to dry refrigerator back-plate condensers for stacking—at the Columbus, Ohio Westinghouse plant, a recent addition to the company's Electric Appliance Division.

Using a fast-drying Fostoria Radiant Oven, this modern plant is able to process 10,000 to 12,000 condensers for major appliances, plus the same number of miscellaneous small parts, every 5-day week. In

thousands of similar industrial applications, Fostoria Radiant Ovens speed up production, save valuable man-power . . . and cut operating costs as much as 50%. Fostoria design permits overhead installation to save work space (as shown above) and allows easy relocation, if necessary. Want to know how an efficient Fostoria Radiant Oven can save money and improve product quality *for you?* Send for complete details today!



Write for free,
fact-filled booklet—
"Applications Unlimited"



FOSTORIA PRESSED STEEL CORPORATION • Dept. 324, Fostoria, Ohio
Pioneer manufacturer of radiant equipment—from components to complete ovens

Another of the Reasons Behind Brad Foote Quality—

CARBON DETERMINATION



• In hardening gear teeth by carburizing, carbon content and depth of penetration are vitally important. BRAD FOOTE insures precise control of these factors through metallurgical tests with equipment developed specifically for this purpose.

• A test bar goes through the complete carburizing and heat-treating cycle with every batch of carburized gears. Shavings are taken from this bar at carefully measured depths. Chemical analysis of these shavings gives complete and precise data on carbon content and penetration.

• Carbon determination tests are only one of many metallurgical controls that insure the uniform quality of BRAD FOOTE Gears. Metallographic examination, hardness testing, chemical analysis—these are just a few of the quality checks provided by BRAD FOOTE's completely equipped metallurgical laboratories.

• Add these precise controls to specialized production and heat-treating equipment and a wealth of detailed experience in producing gears of all types—you begin to appreciate why BRAD FOOTE can produce better quality gears at substantial savings.

• Find out how BRAD FOOTE quality can save you money. Send us the specifications on your next job for quotation. No obligation of course. **BRAD FOOTE MAKES ALL TYPES OF GEARS—IN A COMPLETE RANGE OF STYLES AND SIZES**

BRAD FOOTE GEAR WORKS, INC.

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Bishop 2-1070 • Olympic 2-7700 • TWX CIC-2856-U

AMERICAN GEAR & MFG. CO. PITTSBURGH GEAR COMPANY
Lemont, Illinois • Phone Lemont 920 • Pittsburgh 25, Penn. • Phone Spalding 1-4600

Subsidiaries

Most Versatile Ruthman GUSHER Coolant Pumps

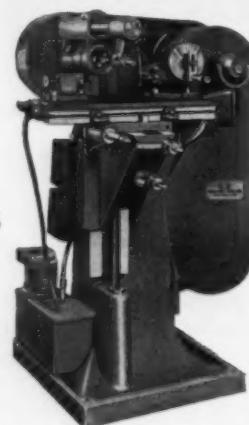


MODEL UL 7120

Popular Model proved in performance by many leading machine tool builders

Gusher Coolant Pumps are available in a wide variety of models to fit almost any requirement. You can choose from immersed, pipe connected, and flange mounted for external or internal discharge in either motor or belt driven types. Tank mounted models for portable use are also available.

Ruthman centrifugal pumps are also available as circulators, agitators, molten metal pumps. Write us your requirements. We will be glad to furnish you further information.



This United States #1 Hand Milling Machine manufactured by U. S. Burke Machine Tool Co. is equipped with a Gusher Coolant Pump.

THE RUTHMAN MACHINERY CO.
1609-1823 READING RD.



CINCINNATI 2, OHIO

NEW EQUIPMENT

Bench grinder

Recently introduced in this country, a new bench grinder permits the operator to see right through the wheel to keep the work-piece surface under constant observation. This method, called visible grinding, utilizes a specially de-



signed unbreakable wheel, which when rotated horizontally at 3600 rpm creates a stroboscopic effect making the wheel, in effect, transparent. The unit's dimensions are 5 1/4 in. x 6 1/4. *Carl Hirschmann Co.* For more data circle No. 45 on postcard, p. 105

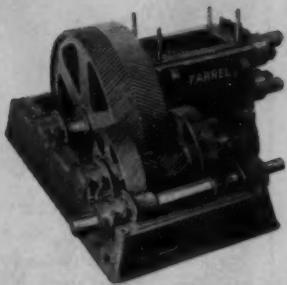
Safety goggles

Single lens safety goggles recommended for light grinding, chipping and chemical operations, are made with soft, pliable vinyl plastic frame in crystal clear or green.



The frame is described as adapting readily to any size or shape of head. Two positive snap fasteners make lens replacement easier and quicker. *Welsh Mfg. Co.* For more data circle No. 46 on postcard, p. 105

SPECIAL DRIVES FOR SPECIAL JOBS



1000 HP Combined Drive and Pinion Stand

Designed to transmit power to a two-high cold brass run-down mill. The first reduction gears are opposed single helical. The second reduction gears and the mill pinions are Farrel-Sykes continuous-tooth herringbone.



150 HP Triple Reduction Unit

The three pairs of continuous-tooth herringbone gears of this special tube mill drive provide a ratio of 113 to 1. A pinion unit is built as an integral part of the drive.

FARREL® METALWORKING MACHINERY — Rolls • Rolling Mills • Slab, Rod and Strip Handling Equipment • Roller Tables • Rod Coilers • Slitters • Gears • Gear Drives of Any Capacity • Mill Pinions • Pinion Stands • Universal Mill Spindles • Flexible Couplings • Roll Grinding Machines • Roll Calipers • Hydraulic Presses for Extruding, Forming, Drawing, Forging, Trimming, Hobbing, Straightening and Bending.



5500 HP Single Reduction Unit

Herringbone geared reduction unit designed to transmit power to a 134" three-high sheared plate mill, reducing motor speed from 375 to 70.35 RPM.



2000 HP Pinion Stand

21" pinion stand, designed to transmit power to a four-high aluminum sheet mill. Heat-treated, forged steel pinions are continuous tooth herringbone, generated by the Farrel-Sykes process.

Whatever your mill drive requirements, no matter how unusual in design, size or capacity, Farrel will meet them. As in the examples given, each unit is individually engineered for the application.

Each Farrel unit is designed to assure top drive efficiency, plus the strength to withstand the shocks, stresses and wear encountered in continuous, heavy duty service.

Gear drives are made with herringbone, single helical, or a combination of single and double helical gears. Pinions are usually herringbone type, although single helical pinions may be supplied. Gears and pinions are precision-generated by the famous Farrel-Sykes process, assuring accuracy of tooth spacing, profile and helix angle. Result: High efficiency and smooth, quiet operation.

Why not discuss your gear drive problems with Farrel engineers?

FARREL-BIRMINGHAM COMPANY, INC.

ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago,
Fayetteville (N. C.), Los Angeles, Houston

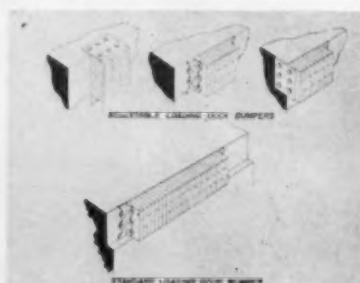
FB-1063

Farrel-Birmingham®

NEW EQUIPMENT

Loading dock bumpers

Constructed of reversible rubber-coated fabric, new loading dock bumpers are designed to minimize dock and truck damage and, therefore, reduce maintenance costs. The bumpers are made in four sizes with standard lengths of 14 in. and 36 in. and a standard thickness of 4½ in. They are built to cover a



facing depth of either 6, 9 or 12 inches. A pair of the bumpers is described as adequate for any single dock. The fabric is mentioned by the maker as remaining resilient when frozen with ice shaling off the bumpers on the first slight impact. *Bumpers, Inc.*

For more data circle No. 47 on postcard, p. 105

New 15 ton punch press

Designed to provide press safety features, as well as offer production versatility and low cost maintenance, a 15 ton punch press is said to incorporate many protections. Some are these: Operator must depress two widely spaced buttons at the same time to single-trip the machine, thus keeping both hands safely occupied. The fly-wheel is eliminated and in single-stroke operation, press and motor go dead after the stroke, eliminating stored-energy, double tripping hazards. Selector switch, which sets press for single-trip, continuous and other types of operation is locked in position. Absence of standard clutching operation eliminates noise and hazard of mechanical clutching. Press is equipped with a heavy-duty safety brake which will apply at any time the power is disconnected or disrupted.

For more data circle No. 48 on postcard, p. 105

GEO. F. MARCHANT COMPANY
1420-34 So. ROCKWELL STREET • CHICAGO 8, ILLINOIS

1420-34 So. ROCKWELL STREET • CHICAGO 8, ILLINOIS

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Stainless Steels

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STRIP • Flat Wire and other Stainless Steels

a foot or a pound
and up

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from the BIGGEST little Con-
verting Mill in the country.

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ground face, upon which the work is secured, which is quickly and easily set with the aid of a protractor and planer gage. For future reference, the position setting need only be recorded from the planer gage reading. *Anton Machine Works.*

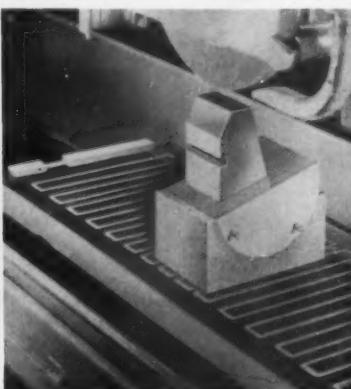
For more data circle No. 49 on postcard, p. 105



NEW EQUIPMENT

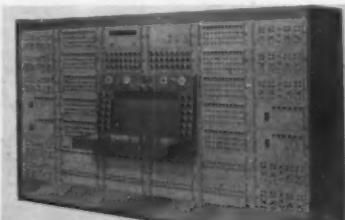
Magnetic workholder

A new adjustable magnetic workholder is recommended for any machine equipped with a magnetic chuck. It is constructed of alternating laminations of brass and iron, possessing high permeability and low residual magnetism. The adjustable holding block has a flat



Analog computer

New analog computer is described as combining linear and nonlinear computing capabilities for accuracy, flexibility and simplicity of operation. In a single console configuration, the manufacturer re-



ports, up to 96 operational amplifiers and 50 or more nonlinear elements can be accommodated, providing one complete computing system or two independent systems. *Goodyear Aircraft Corp.*

For more data circle No. 50 on postcard, p. 105

BAM!



**AS 2 PIECES
BECOME 1 -
SAVE
43¢!**

Raytheon asked PRESTEEL to draw electronic components to close tolerances in cupro-nickel. Thanks to our long experience, we succeeded.

We learned that two identical end rings were later brazed to form a single unit—at considerable expense and with many rejects.

"Why can't PRESTEEL make the unit as a single stamping?" we asked. Design surveys showed all kinds of problems. We still thought it could be done.

Our engineers designed a special set of dies. Result—a new double end ring at \$3.07 per unit, a 43¢ saving! No brazing costs, no rejections.

Take your "pressing" problems to PRESTEEL—save! Send the coupon today.

Get a quote from the
leader — PRESTEEL!



**WORCESTER PRESSED
STEEL COMPANY**

730 Barber Ave., Worcester 6, Mass.

Please ask your representative to call

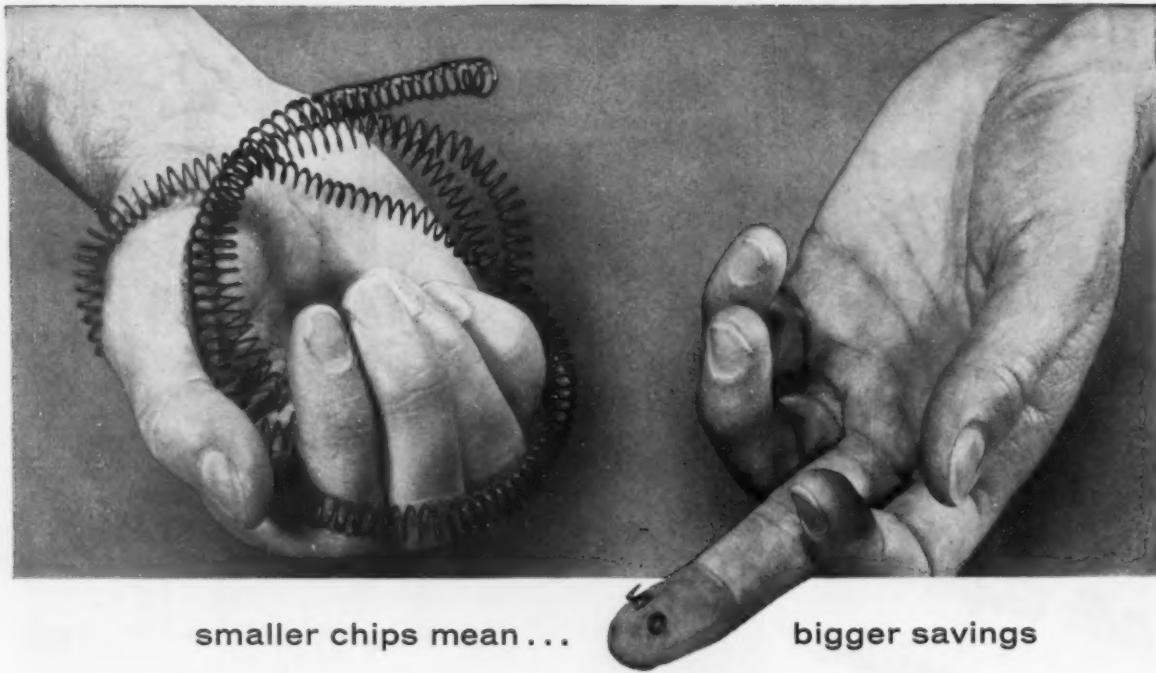
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Cut costs with RYCUT steels!

Three new Ryerson leaded alloys

These short, fast-breaking chips have real meaning to cost-conscious purchasing and production men. In an ever-increasing number of shops, small chips like these mean that the switch has been made to Rycut steels. They mean that tools are turning faster—that production is up as much as 200%.

The secret of Rycut's machining speed is a minute quantity of lead, finely dispersed throughout the steel. This acts as a lubricant between tool and steel. The results are revolutionizing machine shop practice:

- Up to 200% more parts can be produced per machine hour!
- Tool life is lengthened as much as 300%!
- Finish is improved!

There's a Rycut leaded alloy for every application. Use RYCUT 20 when you need a

carburizing alloy; RYCUT 40 for .40 carbon alloy applications; and RYCUT 50 for .50 carbon alloy uses. Every one is a cost-cutter.

Figure how much this increased production and longer tool life would lower costs in YOUR shop—and raise your profits! Call your nearby Ryerson plant today . . . large stocks assure you of quick shipment.

**LEADED PLATE VS. MILD STEEL
A MACHINING DEMONSTRATION
BOOTH 1400 ASTE SHOW**

The remarkable machinability of our New E-Z-Cut leaded plate steel will be demonstrated at the March ASTE Show in Chicago. Don't miss it.

Flame cutting also demonstrated—Watch the actual burning of intricate steel shapes with electric eye equipment.

RYERSON STEEL

In stock: Bars, structurals, plates, sheets, tubing, alloy and stainless steel, reinforcing bars, machinery & tools, etc.

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DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The Iron Age SUMMARY . . .

Look out for a tough second quarter in steel . . . Prices, labor, and plain good business are factors . . . Customers becoming touchy on prices . . . Premiums for plates.

Tough Times Ahead . . . Steel supply in the next three months will be as critical as it's ever been. It will be every man for himself and the devil take the hindmost.

Any steel consumer who tries to play it cagy will find himself on the short end of the stick. It's not only prices and steel labor. It's also the knowledge that caution can sometimes prove fatal—or at least uncomfortable. It's happened too often before.

While some people are talking about a let-down, the facts of the steel market point the other way. Consumers are paying premium prices for plates—\$200 and more per ton, delivered. This is about double the prevailing mill base price. Structural supply is another critical item. And what Detroit has given up in flat-rolled has been quickly snapped up by other consumers. In fact, one of the independent car-makers is feverishly laying in inventory because he's afraid to be caught short when new model production begins. And so it goes.

Price Rhubarb . . . Chances of a peaceful settlement with steel labor are 50-50, or perhaps a little better. But steel consumers cannot afford to gamble. Steel prices will go up in any event.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week	Last Week	Month* Ago	Year Ago
Ingot Index (1947-1949=100)	153.3	153.3	152.2	141.7
Operating Rates				
Chicago	99.0	100.0*	98.5	97.0
Pittsburgh	103.0	102.0	103.0	94.0
Philadelphia	104.0	104.5*	102.0	95.5
Valley	97.0	97.0	98.0	93.0
West	99.0	96.0*	103.0	92.5
Detroit	101.0	101.0*	104.0	90.0
Buffalo	105.0	105.0	105.0	100.0
Cleveland	107.0	106.0	109.0	98.0
Birmingham	88.0	96.0	96.5	87.5
S. Ohio River	98.0	95.0*	91.0	90.0
Wheeling	99.0	101.0*	104.0	100.0
St. Louis	105.0	106.0	104.0	87.0
Northeast	89.0	89.0	85.0	95.0
Aggregate	100.0	100.0	99.5	94.5

*Revised

So a good inventory is better than money in the bank.

Steel users are becoming a bit touchy on prices. The can companies growled "inflation" when a price boost was announced for the April-October price contract period. The increase of 40 cents a base box apparently came as a shock to the can companies.

But steel producers were merely protecting themselves against higher labor costs they know are coming. Also, the can companies are not in as favorable a bargaining position in a steel market marked by recurring periods of shortage. There comes a day of reckoning even for the old bread-and-butter customers.

Oil and Gas . . . Booming activity in the oil and gas fields is straining industry capacity for oil country goods and linepipe. Steel—or lack of it—may be the only limiting factor on the number of wells drilled this year. For all intents and purposes, books are full for balance of the year.

The uncertain Middle Eastern situation is forcing American oil companies to take a closer look at their position domestically and in South America. This increases the pressure on domestic sources of steel.

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.174	5.174	5.174	4.797
Pig Iron (Gross Ton)	\$59.09	\$59.09	\$59.09	\$56.59
Scrap, No. 1 hvy (gross ton)	\$48.83	\$47.83	\$49.00	\$37.50
Nonferrous				
Aluminum ingot	24.40	24.40	24.40	23.20
Copper, electrolytic	46.00	46.00	43.00	33.00
Lead, St. Louis	15.80	15.80	15.80	14.80
Magnesium	33.25	33.25	33.25	27.75
Nickel, electrolytic	64.50	64.50	64.50	67.67
Tin, Straits, N. Y.	102.00	101.25	99.50	90.625
Zinc, E. St. Louis	13.50	13.50	13.50	11.50

Steel Prices Are Touchy

Tinplate price announcement brings quick reaction from can companies . . . Cry of "inflationary" greets scheduled price boost . . . Premium prices mark plate buying.

◆ IT'S RARE for steel consumers to complain publicly about a price increase, particularly in a tight market. But can companies lost little time complaining about the scheduled increase of 40 cents per base box in tinplate, effective April 30.

Tinplate producers said nothing in response to the cry of "inflationary" raised by can companies. But apparently, they were only trying to protect themselves against an expected rise in steel wages when negotiations are concluded this summer. Tinplate prices are set on a contract basis, and the increase will apply from April 30 to Oct. 31.

Bethlehem Steel's challenge to U. S. Steel that its Sparrows Point plant will be the world's largest when present expansion plans are completed was taken up by the Corporation this week.

U. S. Steel Chairman Roger Blough announced that capacity of Gary Works, which now ranks first from a capacity standpoint, will be increased by more than 700,000 tons. This will bring capacity to nearly 8 million tons. When the Sparrows Point project is completed, capacity will be 8.2 million tons. Between now and completion of the two programs, anything might happen to swing the balance one way or another. U. S. Steel's South Works capacity will be raised more than 500,000 tons to almost 6 million tons.

SHEETS AND STRIP . . . Latest word from Pittsburgh mills is that they're pretty well set through the first half on sheet bookings. Fears that automotive order cutbacks might leave gaps in the steel books have died since other consumers are snapping up the released tonnage. However, the quick automotive switch from conversion deals in December to

cutbacks in January has left some mills a little uneasy about the future. In Detroit itself, demand for both sheet and strip is still good. Indications are that automakers are taking their full allotments for May and June, but might taper off slightly in early July. Some cutbacks in strip orders by automakers have been eagerly snapped up by other consumers in Chicago. Result is that mill order books remain fat and full. Hot-rolled sheet and cold-rolled sheet are still tight, however.

BARS . . . Easier availability in this product is noted in several market areas. In Detroit, demand for plain carbon bar has eased somewhat, especially in small sizes. In Chicago, there's some indication that suppliers who carry automotive customers primarily, need business. Any pessimism, however, is countered by optimism that a high level of business will snap back this summer. On the West Coast, demands from automakers for available bar still lead those of other consumers. Mill order books are full through mid-year, and there are still plenty of other industries grabbing up what auto producers don't want.

PLATE . . . Extent of the squeeze on plate is emphasized in word from Milwaukee that some heavy equipment fabricators there are reaching out as far as Philadelphia warehouses. Delivered prices, it's reported, come to about \$200 per ton on warehouse plus

freight. Some broker tonnage of plate is also being offered from Pennsylvania for about \$200, compared to a local mill delivered price of \$110 a ton. Deliveries on plate from mills in the Milwaukee area, promised for last November, are only now beginning to arrive. In Chicago, plate, like structural products, is apparently booked solid for the rest of '56. Linepipe orders are running out to about a year and a half or better, railroad car builders and their suppliers are crying for all the plate they can get. Little let up in plate demand is also noted in the East, Pittsburgh, and West Coast market areas. In Detroit, one producer has recently switched some production to light gage plate in an effort to supply the demand. This, however, isn't helping the die-makers, for example, who need all the heavy plate they can get to fill their own orders.

STRUCTURALS . . . Indefinite slowdowns in construction building projects are mounting rapidly in most market areas as a result of structural scarcities. In Cleveland, for instance, numerous building programs are being seriously delayed by the lack of available light structurals. In many cases, new construction bids are being predicated primarily on the availability of steel and secondly on price. In Chicago, the structural squeeze is further emphasized by the record-setting new orders for construction which already are topping those of first quarter '55. And, on the West Coast, mills are running full blast trying to keep pace with booming construction work all over the Farwest, in the face of limited structural availability.

PRICES . . . Kaiser Steel Corp. increased prices of cold-rolled sheets, continuous weld pipe and semi-finished products \$2 per ton, f.o.b., Fontana, Calif. Pig iron was also advanced \$1.50 per gross ton. Cold-rolled and bar products were unchanged.

CONTINUOUS CASTING . . . Inland Steel Co. and Koppers Co. are "working closely" on a series of tests at the continuous casting plant of Atlas Steels, Ltd., Welland, Ont. Inland recently announced it was holding up on plans for a \$50 million blooming mill while it looks over the possibilities of continuous casting. The implication is that Inland is trying to determine the feasibility of producing carbon steel in quantity by continuous casting, thus obviating the necessity of a new bloomer.

Purchasing Agent's Checklist

DIECASTING: Its markets grow on all fronts . . . p. 46

COPPER: Britain sells wire while U. S. fabricators face shortage . . . p. 144

STEEL: Scramble for steel intensifies in second quarter . . . p. 139

Comparison of Prices

(Effective March 13, 1956)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in Italics.

	Mar. 13 1956	Mar. 6 1956	Feb. 14 1956	Mar. 15 1955	Mar. 13 1956	Mar. 6 1956	Feb. 14 1956	Mar. 15 1955
Flat-Rolled Steel: (per pound)								
Hot-rolled sheets	4.825¢	4.825¢	4.825¢	4.05¢				
Cold-rolled sheets	5.325	5.325	5.325	4.95				
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.45				
Hot-rolled strip	4.325	4.325	4.325	4.05				
Cold-rolled strip	6.29	6.29	6.29	5.79				
Plate	4.52	4.52	4.52	4.225				
Plates, wrought iron	10.40	10.40	10.40	9.30				
Stainl's C-R strip (No. 302)	44.50	44.50	44.50	42.00				
Tin and Terneplate: (per base box)								
Tinplate (1.50 lb.) cokes	\$9.05	\$9.05	\$9.05	\$9.05				
Tinplate, electro (0.80 lb.)	7.75	7.75	7.75	7.75				
Special coated mfg. terne	7.85	7.85	7.85	7.85				
Bars and Shapes: (per pound)								
Merchant bars	4.65¢	4.65¢	4.65¢	4.30¢				
Cold finished bars	5.90	5.90	5.90	5.40				
Alloy bars	5.65	5.65	5.65	5.075				
Structural shapes	4.60	4.60	4.60	4.25				
Stainless bars (No. 302)	38.25	38.25	38.25	35.50				
Wrought iron bars	11.50	11.50	11.50	10.40				
Wire: (per pound)								
Bright wire	6.25¢	6.25¢	6.25¢	5.75¢				
Rails: (per 100 lb.)								
Heavy rails	\$4.725	\$4.725	\$4.725	\$4.45				
Light rails	5.65	5.65	5.65	5.35				
Semi-finish Steel: (per net ton)								
Rerolling billets	\$68.50	\$68.50	\$68.50	\$64.00				
Slabs, rerolling	68.50	68.50	68.50	64.00				
Forging billets	84.50	84.50	84.50	78.00				
Alloy blooms, billets, slab	96.00	96.00	96.00	86.00				
Wire Rod and Skelp: (per pound)								
Wire rod	5.025¢	5.025¢	5.025¢	4.675¢				
Skelp	4.225	4.225	4.225	3.90				
Finished Steel Composite: (per pound)								
Base price	5.174¢	5.174¢	5.174¢	4.797¢				

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

← To identify producers, see Key on P. 152 →

Producing Point	Basic	Fdry.	Mall.	Bess.	Lew Phes.	Product	301	302	303	304	316	321	348	410	416	430
Bethlehem B3	60.50	61.00	61.50	62.00		Ingots, rerolling	17.75	19.00	—	20.25	31.50	25.00	33.75	15.00	—	15.25
Birdsboro, Pa. B6	60.50	61.00	61.50	62.00		Slabs, billets, rerolling	22.25	24.75	26.75	26.00	40.25	32.00	43.00	19.50	—	19.75
Birmingham R3	54.50	55.00*				Forg. discs, die blocks, rings	—	—	—	—	—	—	—	—	—	—
Birmingham W9	54.50	55.00*				Billets, forging	31.75	32.00	34.75	33.75	51.25	38.25	51.00	25.50	26.00	26.00
Birmingham U4	54.50	55.00*				Bars, wires, structures	38.00	38.25	41.00	40.25	60.75	45.25	60.00	30.50	31.00	31.00
Buffalo R3	58.50	59.00	59.50	60.00		Plates	40.00	40.25	42.75	43.00	64.00	49.25	64.75	31.75	32.25	32.25
Buffalo H1	58.50	59.00	59.50	60.00		Sheets	44.25	44.50	52.25	47.25	68.25	54.25	73.50	36.25	—	36.75
Buffalo W6	58.50	59.00	59.50	60.00		Strip, hot-rolled	32.00	34.50	—	37.25	58.25	44.25	50.75	—	—	—
Chester C17	60.50	61.00	61.50			Strip, cold-rolled	41.00	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75
Chicago I4	58.50	59.00	59.50	59.50												
Cleveland A5	58.50	59.00	59.50	59.50	63.50											
Cleveland R3	58.50	59.00	59.50	59.50												
Dubuque I4	58.50	59.00	59.50	59.50												
Erie I4	58.50	59.00	59.50	59.50												
Everett M6	62.50	63.00														
Fantana K1	64.50	65.00														
Geneva, Utah C7	58.50	59.00														
Granite City G2	60.40	60.50	61.40													
Hubbard V1			59.00													
Lean Star L3		55.00														
Midland C11	58.50															
Minnequa C6	60.50	61.00	61.50													
Monessen P6	58.50															
Neville Is. P4	58.50	59.00	59.00													
N. Tonawanda T1	59.00	59.50														
Pittsburgh U1	58.50															
Sharpenell S3	58.50	59.00	59.50													
Se. Chicago R3	58.50	59.00	59.50													
St. John B3	60.50	61.00	61.50	62.00	66.50											
Sweden A2	60.50	61.00	61.50	62.00												
Toledo I4	58.50	59.00	59.50	59.50												
Troy, N. Y. R3	60.50	61.00	61.50	62.00	64.50											
Youngstown Y1			59.00	59.50												

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2, J2; Baltimore, E1; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., J2; Ft. Wayne, J4; Philadelphia, D5.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C5; Sharon, Pa., S7; Butler, Pa., A7; Wallingford, Conn., U3 (.25¢ per lb higher); W1 (.25¢ per lb higher); New Bedford, Mass., R6.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structures: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., J2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C15; Philadelphia, D5.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J2.

Groceries: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R5.

DIFFERENTIALS: Add .5¢ per ton for each .025 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phs., 1.75 to 2.00 pct) .50¢ per ton for each .050 pct manganese or portion thereof over 1. pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional .025 pct nickel. * Add \$1.00 for 0.31-0.69 pct phosph.

Silvery iron: Buffalo, H1: \$46.75; Jackson, J1, G1, \$67.50. Add \$1.25 per ton for each .050 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each .050 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are \$1 over comparable silvery iron.

Market Shows New Strength

**Steelmaking prices advance in Pittsburgh, Chicago
as Philadelphia holds firm . . . Strong broker buying backs the
spurt . . . Birmingham prices down . . . Composite rises \$1.**

◆ **SNAPBACK** in steelmaking grade prices showed up in two major market centers: Pittsburgh and Chicago. Philadelphia prices are holding in the No. 1 grades, though some weakness is still reflected in No. 2 steelmaking prices.

Pittsburgh steelmaking grades advanced \$2 a ton on the basis of broker buying at levels equal to or above the previous mill price. Brokers feel that mills must come in soon with tonnage orders and that any new mill buys will confirm the strength that has already been felt at other levels.

In Chicago, new strength was felt in the market as smaller mills bought at higher price levels. Most steelmaking grades are up \$1. The upward movement is still not across the board and major mills in the area have been resisting the advance. However, observers say it's virtually impossible to cover new orders at previous prices.

Meanwhile, Philadelphia prices for most grades are holding to earlier listings, with some slight weakness still reported in No. 2 steelmaking grades.

Firm market undertones are also noted in New York and Detroit, and in Cleveland where steelmaking grades advanced \$1 on the basis of strong broker activity.

In Birmingham, however, latest broker buying prices for steelmaking grades are reportedly off \$1 to \$2 a ton and indications are that upcoming consumer buying will confirm the downturn. Some blast furnace grades are already off several dollars.

Reflecting the stronger price levels in the Pittsburgh and Chicago markets, THE IRON AGE scrap composite advanced \$1 this week to \$48.83.

Pittsburgh . . . Steelmaking grades advanced \$2 here on the basis of broker buying at levels equal to, or well over, the previous mill price. Good scrap is very tight. Brokers feel the mills must come in soon with tonnage orders and that any new mill buys will confirm the strength that has already been felt at other levels. Railroad grades are up \$1 on the latest lists. Cupola cast advanced \$1 on foundry buying. The shutdown of an area blast furnace figures to strengthen cast grades further. Turnings are showing a firmer tone, moving upward \$1 in a generally strong market.

Chicago . . . Chicago scrap market began cracking open as smaller mills purchased at higher price levels. Broker buying prices equal previous consumer delivered prices. The break-away is still not across the board, and major mills in the area have been resisting the price advance, but it is virtually impossible to cover new orders at previous price levels. While a \$53 factory bundle sale was confirmed at press time, fresh reports indicated the possibility of a \$54 order of substantial tonnage, and broker buying was already advancing past the \$53 level.

Philadelphia . . . General tone of the market remains about the same as last week, with the noticeable weakness in No. 2 steelmaking grades still reported. Brokers and dealers say activity on the whole is firm to steady, with export a limited factor for the time being.

New York . . . Despite small orders from mills in an adjacent consuming district, brokers continue to pay a top of \$44 per ton for No. 1 heavy melting. They claim current collections are sufficient to meet these smaller orders. Turnings also are unchanged. A recent shipment at \$1 per ton premium was specially selected material, not a representative order.

Detroit . . . Indications of a shortage of scrap appeared this week when dealer activity picked up in the area despite the lack of any new orders at the mill level. The undertone of the market remains very firm. Predictions are that the present strength will be maintained.

Cleveland . . . Steelmaking grades moved up \$1 per ton this week on basis of strong broker activity. The market is showing increasing evidence of strength. Although mills are holding off for the moment, scrap is scarce and broker-dealer transactions on filling of old orders indicates a stronger tone.

Birmingham . . . Latest broker buying prices for steelmaking grades are reported at \$1 to \$2 a ton lower than earlier levels. A large area consumer has also indicated that when it resumes buying it will come in at \$2 under previously listed quotations.

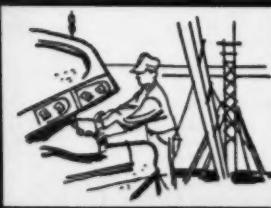
St. Louis . . . Railroad lists closing during the week brought \$1 to \$1.50 increase in prices. Nos. 1 and 2 heavy melting steel and bundles, borings and turnings are stronger in line with other markets, and it is expected that the prices for these items will advance when new contract prices are issued soon. Some cast iron grades are also up \$1.50.

Cincinnati . . . The market moved up \$1 on openhearth and blast furnace grades, reflecting the overall strength of the market and quiet broker activity. Although little actual mill buying occurred at mid-month, prices edged upward on the strength of a tightening market.

Buffalo . . . Strengthening of prices in the Valley is having a firming effect here on No. 1 grades. Some dealers feel prices will remain generally firm for about six weeks.

Boston . . . Prices are somewhat firmer in this week's market with some new buying activity showing up. One consumer, out of the market for some time, has recently come back in again. Export continues a relatively negligible factor at the moment.

West Coast . . . Mills say they're getting all the scrap they want, although less than their melt. Reason: inventories disgustingly healthy. Exporting is fairly active. Some Japanese firms are easing off on West Coast purchases, favoring Gulf Coast ports.



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PLANTS

LEXANDRIA, PENNA.
READING, PENNA.
MONTGOMERY, PENNA.
ERIE, PENNA.

BOSTON (LOGOLES),
MICHIGAN
PITTSBURGH, PENNA.

BIRMINGHAM, ALA.
PORTLAND, MASS.
BUFFALO, N.Y.
CHICAGO, ILLINOIS

CLEVELAND, OHIO
DETROIT, MICHIGAN
HOBOKEN, NEW JERSEY
INDIANAPOLIS, INDIANA
KANSAS CITY, MISSOURI
LOS ANGELES, CALIFORNIA
NEW YORK, NEW YORK
ST. LOUIS, MISSOURI
SAN FRANCISCO, CALIFORNIA
ATLANTA, GEORGIA
MEMPHIS, TENNESSEE
NEW ORLEANS, LOUISIANA
PHILADELPHIA, PENNA.
TAMPA, FLORIDA
WILMINGTON, DELAWARE

READING, PENNA.
ST. LOUIS, MISSOURI
SAN FRANCISCO, CALIFORNIA
ATLANTA, GEORGIA
MEMPHIS, TENNESSEE
NEW ORLEANS, LOUISIANA
WILMINGTON, DELAWARE

IMPORT & EXPORT — LIVINGSTON & SOUTHERN IRON COMPANY — THE LURIA COMPANY — THE LURIA TRADING COMPANY

Scrap Prices (Effective March 15, 1956)

Pittsburgh

No. 1 hvy. melting	\$49.00 to \$50.00
No. 2 hvy. melting	45.00 to 46.00
No. 1 bundles	49.00 to 50.00
No. 2 bundles	42.00 to 43.00
Machine shop turn	34.00 to 35.00
Mixed bor. and ma. turn	34.00 to 35.00
Shoveling turnings	37.00 to 38.00
Cast iron borings	37.00 to 38.00
Low phos. punch'g plate	56.00 to 57.00
Heavy turnings	44.00 to 45.00
No. 1 RR hvy. melting	56.50 to 57.50
Scrap rails, random lgth.	63.00 to 64.00
Rails 2 ft and under	68.00 to 69.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
RR. couplers and knuckles	60.00 to 61.00
No. 1 machinery cast	55.00 to 56.00
Cupola cast	49.00 to 50.00
Heavy breakable cast	45.00 to 46.00

Chicago

No. 1 hvy. melting	\$47.00 to \$48.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 factory bundles	52.00 to 53.00
No. 1 dealers' bundles	47.00 to 48.00
No. 2 dealers' bundles	36.00 to 37.00
Machine shop turn	27.00 to 28.00
Mixed bor. and turn	29.00 to 30.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. forge crops	56.00 to 57.00
Low phos. punch'g plate	53.00 to 54.00
Low phos. 3 ft and under	52.00 to 53.00
No. 1 RR. hvy. melting	51.00 to 52.00
Scrap rails, random lgth.	60.00 to 61.00
Rerolling rails	66.00 to 68.00
Rails 2 ft and under	65.00 to 66.00
Locomotive tires, cut	56.00 to 57.00
Cut bolsters & side frames	56.00 to 57.00
Angles and splice bars	63.00 to 64.00
RR. steel car axles	62.00 to 64.00
RR. couplers and knuckles	56.00 to 57.00
No. 1 machinery cast	52.00 to 53.00
Cupola cast	48.00 to 49.00
Heavy breakable cast	40.00 to 41.00
Cast iron brake shoes	38.00 to 39.00
Cast iron car wheels	46.00 to 47.00
Malleable	59.00 to 60.00
Stove plate	39.00 to 40.00
Steel car wheels	58.00 to 59.00

Philadelphia Area

No. 1 hvy. melting	\$49.00 to \$50.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	49.00 to 50.00
No. 2 bundles	38.00 to 40.00
Machine shop turn	34.00 to 35.00
Mixed bor. short turn	35.00 to 36.00
Cast iron borings	35.50 to 36.50
Shoveling turnings	38.00 to 39.00
Clean cast chem. borings	41.00 to 42.00
Low phos. 5 ft and under	53.00 to 54.00
Low phos. 2 ft and under	55.00 to 56.00
Low phos. punch'g plate	55.00 to 56.00
Elec. furnace bundles	52.00 to 53.00
Heavy turnings	45.00 to 46.00
RR. steel wheels	57.00 to 58.00
RR. spring steel	57.00 to 58.00
Rails 18 in. and under	65.00 to 66.00
Cupola cast	48.00 to 50.00
Heavy breakable cast	52.00 to 53.00
Cast iron car wheels	58.00 to 59.00
Malleable	66.50 to 67.50
Unstripped motor blocks	38.00 to 39.00
No. 1 machinery cast	54.00 to 55.00

Cleveland

No. 1 hvy. melting	\$51.00 to \$52.00
No. 2 hvy. melting	46.00 to 47.00
No. 1 bundles	51.00 to 52.00
No. 2 bundles	39.00 to 40.00
No. 1 busheling	51.00 to 52.00
Machine shop turn	29.00 to 30.00
Mixed bor. and turn	33.00 to 34.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Cut struct'r'l & plates, 2 ft & under	57.00 to 58.00
Drop forge flashings	51.00 to 52.00
Low phos. punch'g plate	51.50 to 52.50
Foundry steel, 2 ft & under	56.00 to 57.00
No. 1 RR. heavy melting	52.00 to 53.00
Rails 2 ft and under	69.00 to 70.00
Rails 18 in. and under	70.00 to 71.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	34.00 to 35.00
Railroad cast	56.00 to 57.00
No. 1 machinery cast	55.00 to 56.00
Stove plate	51.00 to 52.00
Malleable	58.00 to 59.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	\$53.00 to \$54.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 bundles	53.00 to 54.00
No. 2 bundles	41.00 to 42.00
Machine shop turn	29.00 to 30.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	33.00 to 34.00
Low phos. plate	54.00 to 55.00

Buffalo

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 busheling	45.00 to 46.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	33.00 to 34.00
Machine shop turn	27.00 to 28.00
Mixed bor. and turn	28.00 to 29.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	54.00 to 55.00
Scrap rails, random lgth.	51.00 to 52.00
Rails 2 ft and under	65.00 to 66.00
RR. steel wheels	55.00 to 56.00
RR. spring steel	55.00 to 56.00
RR. couplers and knuckles	55.00 to 56.00
No. 1 machinery cast	52.00 to 53.00
No. 1 cupola cast	48.00 to 49.00

Detroit

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles, openhearth	44.00 to 45.00
No. 2 bundles	32.00 to 33.00
New busheling	44.00 to 45.00
Drop forge flashings	43.50 to 44.50
Machine shop turn	20.00 to 21.00
Mixed bor. and turn	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Low phos. punch'g. plate	45.00 to 46.00
No. 1 cupola cast	44.00 to 45.00
Heavy breakable cast	37.00 to 38.00
Stove plate	38.00 to 39.00
Automotive cast	48.00 to 49.00

St. Louis

No. 1 hvy. melting	\$40.50 to \$41.50
No. 2 hvy. melting	37.50 to 38.50
No. 1 bundles	42.50 to 43.50
No. 2 bundles	33.00 to 34.00
Machine shop turn	26.00 to 27.00
Cast iron borings	28.00 to 29.00
Shoveling turnings	28.00 to 29.00
No. 1 RR. hvy. melting	50.00 to 51.00
Rails, random lengths	57.50 to 58.50
Rails 18 in. and under	64.00 to 65.00
Locomotive tires uncut	53.00 to 54.00
Angles and splice bars	54.00 to 55.00
Std. steel car axles	59.00 to 60.00
RR. specialties	55.00 to 56.00
Cupola cast	47.00 to 48.00
Heavy breakable cast	38.50 to 39.50
Cast iron brake shoes	38.50 to 39.50
Stove plate	39.50 to 40.50
Cast iron car wheels	44.00 to 45.00
Rerolling rails	65.00 to 66.00
Malleable	50.00 to 51.00
Unstripped motor blocks	38.00 to 39.00

Boston

No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	32.00 to 32.50
No. 1 bundles	40.00 to 41.00
No. 2 bundles	30.00 to 31.00
No. 1 busheling	40.00 to 41.00
Machine shop turn	23.00 to 24.00
Shoveling turnings	28.00 to 28.50
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast	43.50 to 44.50
Mixed cupola cast	39.00 to 40.00
Heavy breakable cast	42.50 to 43.00
Stove plate	38.00 to 39.00
Unstripped motor blocks	26.00 to 26.50

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	38.00 to 35.00
No. 2 bundles	31.00 to 32.00
Machine shop turn	23.00 to 24.00
Mixed bor. and turn	23.00 to 27.00
Shoveling turnings	26.00 to 27.00
Clean cast chem. borings	32.00 to 33.00
No. 1 machinery cast	47.00 to 48.00
Mixed yard cast	44.00 to 45.00
Unstripped motor blocks	29.00 to 30.00

Birmingham

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	37.00 to 38.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	37.00 to 38.00
Machine shop turn	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	20.50 to 21.50
Electric furnace bundles	44.00 to 45.00
Bar crops and plate, 2 ft	51.00 to 51.00
Structural and plate, 2 ft	50.00 to 51.00
No. 1 RR. hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	57.00 to 58.00
Rails, 18 in. and under	60.00 to 61.00
Angles & splice bars	57.00 to 58.00
Rerolling rails	61.00 to 62.00
No. 1 cupola cast	47.50 to 48.50
Stove plate	46.00 to 47.00
Charging box cast	32.00 to 33.00
Cast iron car wheels	37.00 to 38.00
Unstripped motor blocks	37.00 to 38.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$46.50 to \$47.50
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	46.50 to 47.50
No. 2 bundles	36.00 to 37.00
Machine shop turn	30.00 to 31.00
Mixed bor. and turn	31.00 to 32.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	31.00 to 32.00
Low phos. 18 in. & under	54.00 to 55.00
Rails, random lengths	58.00 to 59.00
Rails, 18 in. and under	65.00 to 66.00
No. 1 cupola cast	45.00 to 46.00
Heavy breakable cast	42.00 to 43.00
Drop broken cast	54.00 to 55.00

San Francisco

No. 1 hvy. melting	\$46.00
No. 2 hvy. melting	30.00
No. 1 bundles	35.00
No. 2 bundles	26.00
No. 3 bundles	20.00
Machine shop turn	18.00
Cast iron borings	20.00
No. 1 RR. hvy. melting	36.00
No. 1 cupola cast	45.00

Los Angeles

No. 1 hvy. melting	\$38.00
No. 2 hvy. melting	32.00
No. 1 bundles	37.00
No. 2 bundles	28.00
No. 3 bundles	22.00
Machine shop turn	18.00
Shoveling turnings	21.00
Cast iron borings	18.00
Elec. furn. 1 ft and under	38.00
No. 1 RR. hvy. melting	38.00
No. 1 cupola cast	44.00

Seattle

No. 1 hvy. melting	\$38.00

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British Swap Copper For Steel

While U. S. fabricators scramble, British doing thriving business selling copper wire, rod to USSR . . . Get desperately needed steel in return . . . Situation will continue.

♦ HAROLD E. STASSEN, special assistant for disarmament to President Eisenhower, recently told the Senate permanent investigating subcommittee that although other Free World nations had agreed not to sell basic copper to Russia, they would sell some copper mill products—primarily wire and rod.

This is a good indication that while U. S. fabricators are straining to land enough copper to keep production lines rolling, others could be getting more than needed for domestic consumption.

Within the last several weeks Chile's minister of mines, Osvaldo Saintmarie, reaffirmed the continuation of his country's policy of shipping two-thirds of Chilean production to Europe.

Europe, for the most part, means London Metals Exchange, where a majority of the tonnage is purchased by British firms for milling in England. It would be stretching it to say that British fabricators are getting all they want, but the fact remains that they are getting enough to carry on a substantial trade with the USSR. One leading British firm shipping to Russia calls the volume of orders from this source in 1955 "astronomical."

In fact, at about the same time Mr. Stassen was making his state-

ment, the British Board of Trade was making an issue of denying rumors that it was putting the damper on exports of copper wire and rod to Russia. The government agency would not be so ready to recognize and react to mere rumors so quickly and loudly if such trade was not widespread and important to the nation. Economist Eliot Janeway has a good explanation—and a good reason for not expecting any change in British policy in the near future.

Britain's average monthly imports of finished steel in 1955 were 181,000 tons, he points out. But near the end of the year the rate skyrocketed to 270,000 tons in December. Imports from Russia followed this pattern very closely—up to 63,000 tons in December, about 25 pct of the total.

England needs steel badly. And with the market in this country staying tight, she is forced to seek other sources. Russia on the other hand needs copper, hence the current arrangements.

As long as (1) England needs steel, (2) Russia needs copper products, and (3) England can get the lion's share of Chilean copper, U. S. fabricators will have to get along on domestic production plus whatever the high regard for the U. S. dollar in world markets will bring in. And as long as these

three factors remain status quo, the price on the London Metals Exchange will stay higher than producers' copper in the U. S.

The big hope of U. S. copper consumers continues to be labor-management peace. The crisis will be in June when U. S. producers and the unions will sit down to negotiate a new contract. If handshaking prevails over fistshaking, world policies will cease to be the major factor and the consumers can expect to finish the year with adequate deliveries—at below the world price level.

MAGNESIUM . . . Meetings to be held during the year for members of the Magnesium Assn., and those interested in industrial applications of magnesium have been announced by Jerry Singleton, executive secretary of the association.

Major get-together will be the annual convention on October 4-5 at The Drake Hotel, Chicago.

Casting Div. and Fabricating Div. will hold a combined session at Hotel Bancroft, Worcester, Mass., April 17-19. Attendance is limited to member companies.

Annual business meeting will be held May 31-June 1 at The Broadmoor, Colorado Springs, Colo.

NICKEL . . . Edmund F. Mansure, retiring head of General Services Administration, has declared the government's nickel plant at Nicaro, Cuba, has in the four years it has been operating returned to the U. S. 24 pct of the initial investment. Production in 1955 amounted to 15,150 tons. The 1956 rate is thus far in excess of the previous year.

SELENIUM . . . The government has issued new export rules in a move to get more mileage out of the tight supplies of selenium.

Effective March 1, the Bureau of Foreign Commerce, U. S. Commerce Dept., is reserving the limited quantity of selenium available for export to meet essential foreign requirements.

The following selenium commodities are affected: powder (schedule B 619-159), metal (B 664998), ferroselenium (B 622098), selenium-containing compounds, including pigments (B 829-810, 839750, 839900, 842900).

Daily Nonferrous Metal Prices

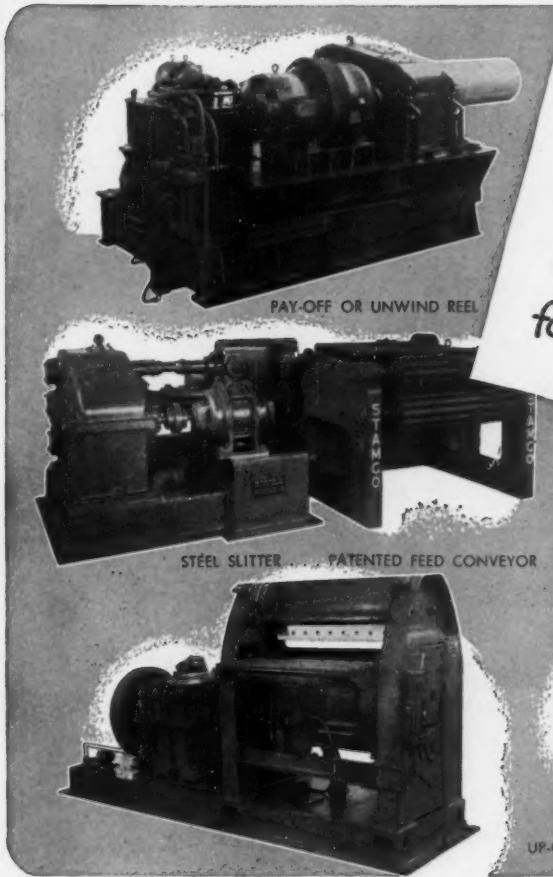
(Cents per lb except as noted)

	Mar. 7	Mar. 8	Mar. 9	Mar. 10	Mar. 12	Mar. 13
Copper, electro, Conn.	46.00	46.00	46.00	46.00	46.00	46.00
Copper, Lake, delivered	46.00	46.00	46.00	46.00	46.00	46.00
Tin, Straits, New York	101.00	101.125	101.50	....	102.00	102.00*
Zinc, East St. Louis	13.50	13.50	13.50	13.50	13.50	13.50
Lead, St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices.

*Tentative

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Nonferrous Prices

(Effective March 18, 1956)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
("F" temper except 6061-0)

Alloy	.033	.081	.196- .349	.350- 8.
1100, 3003	40.8	88.7	87.5	86.5
5052	48.3	43.4	41.7	39.9
6061-0	46.4	41.3	39.4	39.8

Extruded Solid Shapes

Factor	6063 T-5	6063 T-6
8-8	41.0-48.3	56.0-80.3
12-14	42.3-47.7	57.0-61.0
24-26	45.3-46.7	67.7-73.1
32-38	53.0-54.2	90.0-94.8

Screw Machine Stock—2011-T-3

Dia"	34	34-36	36-1	134-134
Price	54.8	53.4	52.1	50.1

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length" →	72	96	120	144
.019 gage	\$1.295	\$1.727	\$2.160	\$2.500
.024 gage	1.618	2.163	2.693	3.283

MAGNESIUM

(f.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type ↓ Gage →	350- 3.00	350- 2.00	135	.064	.033
AES1A Stand. Grade	61	63.5	78	88	
AES1A Spec.	70	83	100	118	
Tread Plate	84	86			
Teeling Plate	68				

Extruded Shapes

1" diam. rod	shape lb/ft			2" OD x 36" W. tubing	
	0.8	1.0	4.0		
Cmm. Grade (PS)	61.50	68.4- 72.6	61.9- 67.8	87.7- 88.3	74.8
Spec. Grade (AES1B)	73	78.9- 83.9	73.4- 78.8	88.3- 88.7	88

Alloy Ingot

AZ91B (Die Casting)..... 11 (delivered)
AZ63A, AZ91A, AZ91C (Sand Casting) 30 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

"A" Nickel	Monel	Inconel	
Sheet, CR	102	83	99
Strip, CR	102	92	125
Rod, Bar, HR	87	74	98
Angles, HR	87	74	98
Plate, HR	87	87	95
Seamless tube, 122	110	158	
Shot, Blocks	71	...	

COPPER, BRASS, BRONZE

(Freight included on 500 lbs)

	Sheet	Wire	Rod	Tube
Copper	70.63			67.32
Brass, 70/30	55.80	56.14		58.51
Brass, Low	60.15	60.69	60.09	62.96
Brass, R.L.	61.79	62.33	61.73	64.60
Brass, Naval	58.90	65.96	53.21	62.06
Muntz Metal	56.94	52.75	52.75	
Comm. Bs.	63.98	64.82	63.92	66.54
Mang. Bs.	62.75	67.09	56.65	
Phos. Bs. 5%	85.37	85.87	85.87	

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95.97%	29.00-30.00
Grade 2—92.95%	28.00-29.00
Grade 3—90.92%	27.50-28.50
Grade 4—85.90%	27.00-28.00

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

Heavy	Turnings
Copper	42 41 1/2
Yellow brass	31 1/4 29
Red brass	37 36 1/2
Comm. bronze	38 1/4 37 1/2
Mang. bronze	29 1/4 28 1/2
Yellow brass rod ends	31

Custom Smelters Scrap

(Cents per pound carload lots, delivered in refinery)

No. 1 copper wire	45 1/2
No. 2 copper wire	44
Light copper	41 1/2
No. 1 composition	36 1/2
No. 1 comp. turnings	36
Hvy. yellow brass solids	27
Brass pipe	28
Radiators	28 1/2

* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	45 1/2
No. 2 copper wire	44
Light copper	41 1/2
No. 1 composition	36 1/2
No. 1 comp. turnings	36
Hvy. yellow brass solids	27
Brass pipe	28
Radiators	28 1/2

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	43 44
No. 2 heavy copper and wire	41 41 1/2
Light copper	39 29 1/2
New type shell cuttings	33 1/2 39
Auto radiators (unsweated)	35 1/2 34
No. 1 composition	31 31 1/2
No. 1 composition turnings	36 26 1/2
Unlined red car boxes	27 23
Cocks and faucets	22 23
Clean heavy yellow brass	27 28
Brass pipe	28 28 1/2
New soft brass clippings	26 26 1/2
No. 1 brass rod turnings	26 26 1/2

Aluminum

Alum. pistons and struts	17 17 1/2
Aluminum crankcases	14 14 1/2
1100 (28) aluminum clippings	19 1/2-20
Old sheet and utensils	16 1/2-17 1/4
Borings and turnings	11 1/2-12
Industrial castings	16 1/2-17 1/4

2024 (24S) clippings	18 18 1/2
New zinc clippings	8 9

Old zinc

6 6 1/2

Zinc routings

4 4

Old die cast scrap

3 1/2

Nickel and Monel

Pure nickel clippings	\$1.60
Clean nickel turnings	\$1.25
Nickel anodes	\$1.50
Nickel rod ends	\$1.50
New Monel clippings	60
Clean Monel turnings	50
Old sheet Monel	55
Nickel silver clippings, mixed	25
Nickel silver turnings, mixed	21

Lead

Soft scrap lead	12 1/2-13
Battery plates (dry)	7 7 1/4

Batteries, acid free

4 1/2

Miscellaneous

Block tin	84 85
No. 1 pewter	66 67
Auto babbitt	43 1/2-44 1/2
Mixed common babbitt	15 1/2
Solder joints	20 20 1/2
Siphon tops	50
Small foundry type	16 1/2-16 1/2
Monotype	15 1/2-16
Lino. and stereotype	14 1/2-15
Electrotypes	13 13 1/2
Hand picked type shells	10 1/2-11
Lino. and stereo. dress	5 5 1/2
Electro. dress	4 4 1/2

IRON AGE

STEEL PRICES

(Effective March 13, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS		PIL- ING	SHAPES STRUCTURALS		STRIP							
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hat- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.			\$96.00 B3		4.65 B3	6.80 B3	4.65 B3						
	Buffalo, N. Y.	\$88.50 B3	\$84.50 R3, B3	\$96.00 R3, B3	5.45 B3	4.65 B3	6.80 B3	4.65 B3	4.325 R3, B3	6.25 B3 6.25 R7, S10	6.425 B3	9.10 B3		
	Claymont, Del.													
	Harrison, N. J.													13.45 C/I
	Coopersburg, Pa.													
	New Bedford, Mass.													
	Johnstown, Pa.	\$88.50 B3	\$84.50 B3	\$96.00 B3		4.65 B3	6.80 B3							
	Boston, Mass.													
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.													
	Bridgeport, Wallingford, Conn.	\$73.50 N8	\$89.50 N8											
	Pawtucket, R. I.													
	Worcester, Mass.													
MIDDLE WEST	Alton, Ill.								4.50 L1					
	Ashland, Ky.								4.325 A7					
	Canton-Massillon, Deer, Ohio													13.45 G4
	Chicago, Ill.	\$88.50 U1	\$84.50 R3, U1, W8	\$96.00 R3, U1, W8	5.45 U1	4.60 U1, W8	6.75 U1, Y1	4.60 U1	4.325 A1/ 4.325 N4, W8	6.35 A1, T8				7.20 W8 13.45 T8
	Cleveland, Ohio													
	Detroit, Mich.													
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	\$88.50 U1	\$84.50 U1	\$96.00 U1, Y1	5.45 I3	4.60 U1, I3	6.75 U1, I3		4.325 I3, U1, Y1	6.35 I3 6.25 Y1	6.425 I3, U1, Y1	9.30 Y1	7.20 Y1, U1	
	Sterling, Ill.													
	Indianapolis, Ind.													
	Newport, Ky.													7.20 NS
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.	\$88.50 C10	\$84.50 C10	\$96.00 C10										
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$88.50 U1, J3	\$84.50 J3, U1, C11	\$96.00 U1, C11	5.45 U1	4.60 U1, J3	6.75 U1, J3	4.60 U1	4.325 P6	6.25 S7, B4				7.20 S9 13.45 S9
WEST	Parma, Ohio													
	Watson, Wheeling, Follansbee, W. Va.													
	Youngstown, Ohio													
	Fountain, Cal.	\$76.00 K1	\$92.00 K1	\$115.00 K1		5.25 K1	7.40 K1	5.40 K1	5.075 K1	6.00 K1	7.325 K1			8.25 K1
	Geneva, Utah													
	Kansas City, Mo.													
	Los Angeles, Torrance, Cal.													
	Minneapolis, Colo.													
	Portland, Ore.													
	San Francisco, Niles, Pittsburg, Cal.													
SOUTH	Seattle, Wash.													
	Atlanta, Ga.													
	Fairfield, Ala. City, Birmingham, Ala.	\$88.50 T2	\$84.50 T2											
	Houston, Lone Star, Tex.	\$74.50 L3	\$89.50 S2	\$101.00 S2		4.70 S2	6.85 S2							

IRON AGE STEEL PRICES <i>(Effective March 18, 1956)</i>		Prices identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.									WIRE ROD		TINPLATE†		BLACK PLATE	
		SHEETS														
		Hot-rolled 18 ga. & hrvr.	Cold- rolled	Galvanized 18 ga.	Enamel- ing 12 ga.	Long Teme 16 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot- rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.		
EAST	Bethlehem, Pa.															
	Buffalo, N. Y.	4.325 B3	5.325 B3				6.375 B3	7.875 B3			5.375 W6					
	Clayton, Del.															
	Coatesville, Pa.															
	Conshohocken, Pa.	4.375 A2	5.375 A2				6.425 A2									
	Harrisburg, Pa.															
	Hartford, Conn.															
	Johnstown, Pa.															
	Fairless, Pa.	4.375 U1	5.375 U1				6.425 U1	7.925 U1					\$9.30 U1	\$8.00 U1		
	New Haven, Conn.															
	Phoenixville, Pa.															
	Sparrows Pt., Md.	4.325 B3	5.325 B3	5.85 B3			6.375 B3	7.875 B3	8.60 B3		5.475 B3	\$9.30 B3	\$8.00 B3			
	Worcester, Mass.												5.675 A5			
	Trenton, N. J.															
MIDDLE WEST	Alton, Ill.												5.55 L1			
	Ashland, Ky.	4.325 A7		5.85 A7	5.90 A7											
	Canton-Massillon, Dover, Ohio			5.85 RI, R3												
	Chicago, Joliet, Ill.	4.55 A1 4.325 WB					6.375 U1						5.375 N4 5.375 A5, R3			
	Sterling, Ill.												5.475 N4			
	Cleveland, Ohio	4.325 J3, R3	5.325 J3, R3		5.90 R3		6.375 J3, R3	7.875 J3, R3					5.375 A5			
	Detroit, Mich.	4.425 G3, M2	5.425 G3 5.325 M2				6.475 G3	7.975 G3								
	Newport, Ky.	4.325 N5	5.325 N5	5.85 N5												
	Gary, Ind. Harbor, Indiana	4.325 I3, U1, Y1	5.325 I3, U1, Y1	5.85 U1, I3	5.90 U1, I3	6.25 U1	6.375 Y1, U1, I3	7.875 U1, Y1				5.375 Y1	\$9.20 I3, U1, Y1	\$7.90 I3, U1, Y1	6.65 U1, Y1	
	Granite City, Ill.	4.525 G2	5.525 G2	6.05 G2	6.10 G2									\$8.00 G2	6.75 G2	
	Kokomo, Ind.		5.95 C9										5.475 C9			
	Mansfield, Ohio	4.325 E7	5.325 E7			6.25 E2					E2					
	Middletown, Ohio	5.325 A7	5.85 A7	5.90 A7	6.25 A7											
	Niles, Warren, Ohio Sharpen, Pa.	4.325 S1, R3, N3	5.325 R3, N3	5.85 R3 6.05 N3	5.90 N3	6.25 N3	6.375 S1, R3	7.875 R3					\$9.20 R3	\$7.90 R3		
WEST	Pittsburgh, Pa.	4.325 I3, U1, P6	5.325 I3, U1, P6	5.85 U1	5.90 U1, A7		6.375 J3, U1	7.875 U1	8.60 U1		5.825 P6 5.375 A5					
	Portsmouth, Ohio	4.325 P7	5.325 P7										5.375 P7			
	Weirton, Wheeling, Fellowsbee, W. Va.	4.325 W3, W5	5.325 W3, W5, F3	5.85 W3, W5		6.25 W3, W5	6.375 W3	7.875 W3					\$9.20 W3, W5	\$7.90 W3, W5	6.65 F3, W5	
	Youngstown, Ohio	4.325 U1, Y1	5.325 Y1		5.90 Y1		6.375 U1, Y1	7.875 Y1					5.375 Y1			
	Fontana, Cal.	5.075 K1	6.425 K1				7.125 K1	8.975 K1								
	Geneva, Utah	4.425 C7														
	Kansas City, Mo.												5.825 S2			
SOUTH	Los Angeles, Torrance, Cal.												6.175 B2			
	Minnequa, Colo.												5.275 C6			
	San Francisco, Niles, Pittsburgh, Cal.	5.025 C7	6.275 C7	6.88 C7									5.675 C7	\$9.95 C7	\$8.65 C7	
	Seattle, Wash.															
SOUTH	Atlanta, Ga.															
	Fairfield, Ala.	4.325 R3, T2	5.325 T2	5.85 R3, T2			6.375 T2				5.625 R3	5.825 R3, T2	\$9.30 T2	\$8.00 T2		
	Houston, Tex.												5.625 S2			

**STEEL
PRICES**
(Effective
March 13, 1956)*Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.***BARS****PLATES****WIRE**

	Carbon Merchant	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.			5.575 B3	7.425 B3	6.80 B3					
	Buffalo, N. Y.	4.65 B3,R3	4.65 B3,R3	6.30 B5	5.575 B3,R3	7.425 B3,B5	6.80 B3	4.50 B3,R3			6.80 W6
	Claymont, Del.							4.80 C4	6.30 C4	6.725 C4	
	Centesville, Pa.							4.80 L4	6.30 L4	6.725 L4	
	Coopersburg, Pa.							4.50 A2	5.575 A2	6.725 A2	
	Harrisburg, Pa.							5.10 P2	5.575 C3		
	Hartford, Conn.		6.40 R3		7.725 R3						
	Johnstown, Pa.	4.65 B3	4.65 B3		5.575 B3		6.80 B3	4.50 B3	6.30 B3	6.725 B3	6.80 B3
	Fairless, Pa.	4.80 U1	4.80 U1		5.725 U1						
	Newark, N. J.			6.70 W10		7.50 W10					
	Camden, N. J.			6.70 P10							
	Bridgeport, Putnam, Conn.	4.80 N8		6.80 W10	5.725 N8			4.750 N8			
	Sparrows Pt., Md.		4.65 B3					4.50 B3	6.30 B3	6.725 B3	6.70 B3
	Paterson, Worcester, Readville, Mass. Milton, Pa.	4.80 M7	4.80 M7	6.70 W11 6.45 C14 6.70 B3		7.725 A5,B5		4.50 R3			6.90 A5 6.90 W6
	Spring City, Pa.			6.35 K4		7.50 K4					
MIDDLE WEST	Altan, Ill.	4.85 L1									6.775 L1
	Ashland, Newport, Ky.							4.50 A7,N5	6.30 N5		
	Canton-Massillon, Massillon, Ohio	4.75 R3		6.25 R2,R3	5.575 R3,T5	7.425 R2,R3, T5		4.50 E1			
	Chicago, Joliet, Ill.	4.65 U1, N4,W6,R3, P13	4.65 N4,R3, P13	6.25 B5,W8, W10,A5,L2	5.575 U1,R3, W8	7.425 A5,W8, W10,L2,B5		4.50 U1,W8, I3,R3 6.725 A1	5.575 U1	6.30 U1	6.725 U1 6.80 A5,R3, N4,W7
	Cleveland, Ohio	4.65 R3	4.65 R3	6.25 A5,C13		7.425 A5,C13	6.80 R3	4.50 J3,R3	5.575 J3		6.725 R3,J3 6.80 A5, C13
	Detroit, Mich.	4.75 G3	4.75 G3	5.80 R5 6.45 R3 6.15 P3 6.10 P8	5.575 R5 5.675 G3	7.425 R5 7.625 B5,P3, P8	6.90 G3	4.50 G3			6.825 G3
	Duluth, Minn.										6.80 A5
	Gary, Ind. Harbor, Crawfordsville	4.65 I3,U1, Y1	4.65 I3,U1, Y1	6.25 M5,R3	5.575 I3,U1, Y1	7.425 M5, R3	6.80 U1,I3, Y1	4.50 I3, U1,Y1	5.575 I3	6.30 U1,Y1	6.725 U1, I3,Y1 6.35 M4
	Granite City, Ill.							4.70 G3			
	Kokomo, Ind.										6.70 C9
	Sterling, Ill.	4.75 N4	4.75 N4								6.70 N4
	Niles, Warren, Ohio Sharon, Pa.	4.65 R3,C10		6.25 C10	5.575 C10	7.425 C10	6.80 R3	4.50 S1,R3		6.30 S1	6.725 S1
	Pittsburgh, Pa. Midland, Pa.	4.65 J3,U1, C11	4.65 J3,U1	6.25 A5,C8, C11,J3, W10,B4,R3	5.575 U1,C11	7.425 A5,C11, W10,C8,R3	6.80 J3,U1	4.50 J3,U1	5.575 U1	6.30 U1	6.725 J3,U1 6.80 A5,P6
	Portsmouth, Ohio										6.80 P7
	Weirton, Wheeling, Follansbee, W. Va.	4.65 W3						4.50 W3,W5			
	Youngstown, Ohio	4.65 U1,Y1, C10,R3	4.65 U1,Y1, R3	6.25 Y1,U1	5.575 U1,Y1, C10	7.425 Y1,C10, F2	6.80 U1,Y1	4.50 U1,Y1, R3		6.30 Y1	6.725 Y1 6.80 Y1
WEST	Emeryville, Cal.	5.40 J5	5.40 J5								
	Fontana, Cal.	5.35 K1	5.35 K1		6.625 K1		7.50 K1	5.15 K1		6.95 K1	7.375 K1
	Genoa, Utah							4.50 C7			6.725 C7
	Kansas City, Mo.	4.90 S2	4.90 S2		5.825 S2		7.05 S2				6.85 S2
	Los Angeles, Terrance, Cal.	5.35 B2,C7	5.35 B2,C7	7.35 R3	6.625 B2		7.50 B2				7.625 B2 7.55 B2
	Minneapolis, Colo.	5.10 C6	5.10 C6					5.35 C6			6.50 C6
	Portland, Ore.	5.40 O2	5.40 O2								
	San Francisco, Niles, Pittsburg, Cal.	5.35 C7 5.40 B2,P9	5.35 C7 5.40 B2,P9				7.55 B2				7.20 C7
	Seattle, Wash.	5.40 B2,P12, N6	5.40 B2,P12				7.55 B2	5.40 B2		7.20 B2	7.625 B2
SOUTH	Atlanta, Ga.	4.85 AB	4.85 AB								6.45 AB
	Fairfield, Ala. City, Birmingham, Ala.	4.65 T2,R3 5.15 C16	4.65 T2,R3 5.15 C16				6.80 T2	4.80 T2,R3		6.725 T2	6.80 R3, T2
	Houston, Ft. Worth, Lone Star, Tex.	4.80 S2	4.80 S2		5.825 S2		7.85 S2	4.85 L3 6.80 S2		6.40 S2	6.825 S2 6.85 S2

Steel Prices (Effective March 19, 1956)

Key to Steel Producers

With Principal Offices

A1	Acme Steel Co., Chicago
A2	Alan Wood Steel Co., Conshohocken, Pa.
A3	Allegheny Ludlum Steel Corp., Pittsburgh
A4	American Cladmetals Co., Carnegie, Pa.
A5	American Steel & Wire Div., Cleveland
A6	Angell Nail & Chaplet Co., Cleveland
A7	Armcro Steel Corp., Middletown, O.
A8	Atlantic Steel Co., Atlanta, Ga.
B1	Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2	Bethlehem Pacific Coast Steel Corp., San Francisco
B3	Bethlehem Steel Co., Bethlehem, Pa.
B4	Bair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Inc., Harvey, Ill.
B6	Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
C1	Calstrip Steel Corp., Los Angeles
C2	Carpenter Steel Co., Reading, Pa.
C3	Central Iron & Steel Co., Harrisburg, Pa.
C4	Claymont Products Dept., Claymont, Del.
C5	Cold Metal Products Co., Youngstown, O.
C6	Colorado Fuel & Iron Corp., Denver
C7	Columbia Geneva Steel Div., San Francisco
C8	Columbia Steel & Shafing Co., Pittsburgh
C9	Continental Steel Corp., Kokomo, Ind.
C10	Copperweld Steel Co., Pittsburgh, Pa.
C11	Crucible Steel Co. of America, Pittsburgh
C12	Cumberland Steel Co., Cumberland, Md.
C13	Cuyahoga Steel & Wire Co., Cleveland
C14	Compressed Steel Shafing Co., Readville, Mass.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Div., Birmingham
C17	Chester Blast Furnace, Inc., Chester, Pa.
D1	Detroit Steel Corp., Detroit
D2	Detroit Tube & Steel Div., Detroit
D3	Driver Harris Co., Harrison, N. J.
D4	Dickson Weatherproof Nail Co., Evanston, Ill.
D5	Henry Duzon & Sons, Inc., Philadelphia
E1	Eastern Stainless Steel Corp., Baltimore
E2	Empire Steel Co., Mansfield, O.
F1	Firth Sterling, Inc., McKeesport, Pa.
F2	Fitzsimmons Steel Corp., Youngstown
F3	Follansbee Steel Corp., Follansbee, W. Va.
G1	Globe Iron Co., Jackson, O.

G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Corp., Detroit
G4	Greer Steel Co., Dover, O.
H1	Hanna Furnace Corp., Detroit
I2	Ingersoll Steel Div., Chicago
I3	Inland Steel Co., Chicago
I4	Interlake Iron Corp., Cleveland
J1	Jackson Iron & Steel Co., Jackson, O.
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Jeslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Cal.
K2	Keystone Steel & Wire Co., Peoria
K3	Koppers Co., Granite City, Ill.
K4	Keystone Drawn Steel Co., Spring City, Pa.
L1	Laclede Steel Co., St. Louis
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
M1	Mahoning Valley Steel Co., Niles, O.
M2	McLouth Steel Corp., Detroit
M3	Mercer Tube & Mfg. Co., Sharon, Pa.
M4	Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5	Monarch Steel Div., Hammond, Ind.
M6	Mystic Iron Works, Everett, Mass.
M7	Milton Steel Products Div., Milton, Pa.
N1	National Supply Co., Pittsburgh
N2	National Tube Div., Pittsburgh
N3	Niles Rolling Mill Div., Niles, O.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N5	Newport Steel Corp., Newport, Ky.
N6	Northwest Steel Rolling Mills, Seattle
N7	Newman Crosby Steel Co., Pawtucket, R. I.
N8	Northeastern Steel Corp., Bridgeport, Conn.
O1	Oliver Iron & Steel Co., Pittsburgh
O2	Oregon Steel Mills, Portland
P1	Page Steel & Wire Div., Monessen, Pa.
P2	Phoenix Iron & Steel Co., Phoenixville, Pa.
P3	Pilgrim Drawn Steel Div., Plymouth, Mich.
P4	Pittsburgh Coke & Chemical Co., Pittsburgh
P5	Pittsburgh Screw & Bolt Co., Pittsburgh
P6	Pittsburgh Steel Co., Pittsburgh
P7	Plymouth Div., Detroit Steel Corp., Detroit
P8	Plymouth Steel Co., Detroit
P9	Pacific States Steel Co., Niles, Cal.
P10	Precision Drawn Steel Co., Camden, N. J.
P11	Production Steel Strip Corp., Detroit
P12	Pacific Steel Rolling Mills, Seattle
P13	Phoenix Mfg. Co., Joliet, Ill.
R1	Reeves Steel & Mfg. Co., Dover, O.
R2	Reliance Div., Eaton Mfg. Co., Massillon, O.
R3	Republic Steel Corp., Cleveland
R4	Roebing Sons Co., John A. Trenton, N. J.
R5	Rotary Electric Steel Co., Detroit
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S2	Sheffield Steel Corp., Kansas City
S3	Shenango Furnace Co., Pittsburgh
S4	Simonds Saw and Steel Co., Fitchburg, Mass.
S5	Sweet's Steel Co., Williamsport, Pa.
S6	Standard Forging Corp., Chicago
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S9	Superior Steel Corp., Carnegie, Pa.
S10	Seneca Steel Service, Buffalo
T1	Tonawanda Iron Div., N. Tonawanda, N. Y.
T2	Tennessee Coal & Iron Div., Fairfield
T3	Tennessee Products & Chem. Corp., Nashville
T4	Thomas Strip Div., Warren, O.
T5	Timken Steel & Tube Div., Canton, O.
T6	Tremont Nail Co., Warcham, Mass.
T7	Texas Steel Co., Fort Worth
T8	Thompson Wire Co., Boston
U1	United States Steel Corp., Pittsburgh
U2	Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3	Ulrich Stainless Steels, Wallingford, Conn.
U4	U. S. Pipe & Foundry Co., Birmingham
W1	Wallingford Steel Co., Wallingford, Conn.
W2	Washington Steel Corp., Washington, Pa.
W3	Weirton Steel Co., Weirton, W. Va.
W4	Wheatland Tube Co., Wheatland, Pa.
W5	Wheeling Steel Corp., Wheeling, W. Va.
W6	Wickwire Spencer Steel Div., Buffalo
W7	Wilson Steel & Wire Co., Chicago
W8	Wisconsin Steel Co., S. Chicago, Ill.
W9	Woodward Iron Co., Woodward, Ala.
W10	Wyckoff Steel Co., Pittsburgh
W11	Worcester Pressed Steel Co., Worcester, Mass.
W12	Wallace Barnes Steel Div., Bristol, Conn.
Y1	Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (per) f.o.b. mills. Base price about \$200 per net ton.

STANDARD T. & C.	BUTTWELD												SEAMLESS												
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	
Sparrows Pt. B3.....	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown R3.....	18.50	1.25	21.50	5.25	24.00	8.75	26.50	10.00	27.00	11.00	27.50	11.50	29.00	11.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fontana K1.....	7.00	+2.25	10.00	+8.25	12.50	+4.75	15.00	+3.00	15.50	+2.00	16.00	+1.50	17.50	+0.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh J3.....	18.50	1.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	18.50	+6.25	13.00	+3.75	14.50	+2.25	.....	.....
Alton, Ill. L1.....	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sharon M1.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fairless N2.....	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh N1.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	18.50	+6.25	13.00	+3.75	14.50	+2.25	.....	.....
Wheeling W5.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wheeling W4.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	18.50	+6.25	13.00	+3.75	14.50	+2.25	.....	.....
Youngstown Y1.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	18.50	+6.25	13.00	+3.75	14.50	+2.25	.....	.....
Indiana Harbor Y1.....	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.00	26.00	11.50	26.50	12.00	28.00	11.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lorain N2.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	18.50	+6.25	13.00	+3.75	14.50	+2.25	.....	.....
EXTRA STRONG PLAIN ENDS	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sparrows Pt. B3.....	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown R3.....	23.00	7.25	27.00	11.25	29.00	14.75	29.50	14.00	30.00	15.00	30.50	15.50	31.00	14.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fairless N2.....	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fontana K1.....	11.50	.....	15.50	.....	17.50	.....	18.00	.....	18.50	.....	19.00	.....	19.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh J3.....	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75	.....	.....
Alton, Ill. L1.....	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sharon M1.....	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75	.....	.....
Pittsburgh N1.....	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75	.....	.....
Wheeling W5.....	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75	.....	.....
Youngstown Y1.....	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75	.....	.....
Indiana Harbor Y1.....	22.00	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75	.....	.....
Lorain N2.....	21.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75	.....	.....

Threads only, butt-weld and seamless 2 1/2 pt higher discount. Plain ends, butt-weld and seamless, 3-in. and under, 5 1/2 pt higher discount.
 Galvanized discounts based on nine price range at over 90 to 110 per lb. East St. Louis. For each 2x change in nine discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 pt.; 2 1/2 and 3-in., 1 pt. e.g., nine price range of over 110 to 130 would lower discounts; nine price in range over 70 to 90 would increase discounts. East St. Louis nine price now 13.50 per lb.

(Effective March 15, 1956)

TOOL STEEL

F.o.b. mill	Cr	V	Mo	Co	per lb
18	4	1	—	—	\$1.40
18	4	1	—	—	2.305
18	4	2	—	—	1.765
1.5	4	1.5	.8	—	.96
6	4	2	.8	—	1.35
6	4	2	.5	—	1.105
High-carbon chromium					.77
Oil hardened manganese					.43
Special carbon					.39
Extra carbon					.33
Regular carbon					.275
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi are 6¢ higher.					

CLAD STEEL

Stainless Type	Plate (A3, J2, L4)			Sheet (J2)		
	10 pct	15 pct	20 pct	20 pct	—	—
304.....	30.30	33.15	34.95	32.50	—	—
316.....	35.50	38.45	41.40	47.00	—	—
321.....	32.00	34.85	37.75	37.25	—	—
347.....	34.40	37.90	41.40	48.25	—	—
485.....	25.80	29.60	33.35	—	—	—
410, 430.....	25.30	29.10	32.85	—	—	—
CR Strip (B5) Copper, 10 pct, 2 sides, 33.00; 1 side, 30.00.						

WARE-HOUSES

City	Cents Per Lb Delivery Charge	Sheets		Strip	Plates Shapes		Bars	Alloy Bars						
		Hot-Rolled	Cold-Rolled	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled As rolled	Hot-Rolled Annealed	Cold-Drawn As rolled	Cold-Drawn Annealed		
Baltimore.....	9.10	7.31	8.32	8.37	7.45	—	7.63	7.93	7.61	8.62	14.38	13.44	16.36	16.29
Birmingham.....	15	6.80	7.93	8.85	7.06	—	6.99	7.28	7.08	9.35	—	13.98	16.49	—
Boston.....	10	7.85	8.91	10.37	8.06	—	7.99	8.23	7.97	9.77	—	13.60	—	16.70
Buffalo.....	15	7.35	8.40	10.16	7.50	—	7.80	7.75	7.50	8.25	—	13.45	—	16.50
Chicago.....	15	7.28	8.29	9.25	7.36	—	7.60	7.58	7.42	7.90	—	13.20	—	16.30
Cincinnati.....	15	7.40	8.23	9.10	7.45	—	7.89	7.90	7.51	8.15	13.39	13.29	16.44	16.39
Cleveland.....	15	7.28	8.24	8.95	7.31	—	7.77	7.76	7.33	8.00	13.41	13.11	16.26	16.21
Denver.....	8.60	10.70	11.22	8.90	—	—	8.60	8.75	8.90	9.82	—	—	—	17.97
Detroit.....	15	7.47	8.43	9.53	7.49	—	7.88	7.90	7.55	—	13.70	13.40	16.55	16.50
Houston.....	7.85	8.75	10.49	8.15	—	—	7.80	8.20	8.25	9.85	14.35	14.00	17.15	17.05
Kansas City.....	20	7.47	8.76	9.17	7.73	—	7.66	7.95	7.75	8.52	13.87	13.52	16.72	16.57
Los Angeles.....	10	8.60	10.10	11.10	8.45	—	8.85	8.40	8.25	11.00	—	14.45	—	18.00
Memphis.....	10	7.12	8.25	—	7.38	—	7.31	7.60	7.40	9.15	—	—	—	—
Milwaukee.....	15	7.37	8.48	9.34	7.45	—	7.69	7.75	7.51	8.09	—	13.29	—	16.39
New Orleans.....	15	7.20	8.35	—	7.45	—	7.40	7.70	7.50	9.55	—	—	—	—
New York.....	10	7.71	8.94	9.69	8.27	—	7.96	8.19	8.21	9.68	—	13.53	—	16.63
Norfolk.....	20	7.25	—	—	7.65	—	7.45	7.95	7.65	9.50	—	—	—	—
Philadelphia.....	10	7.42	8.52	9.47	8.03	—	7.78	7.84	7.78	8.56	—	13.31	—	16.41
Pittsburgh.....	15	7.28	8.24	9.40	7.31	9.08	7.60	7.43	7.27	8.00	13.35	13.05	16.20	16.15
Portland.....	7.80- 8.80-	10.65	8.00	7.95	—	—	7.75	7.85-	7.95	12.20	—	15.00	—	17.50
Salt Lake City.....	8.60	10.15	—	9.35	—	—	8.15	—	—	—	—	—	—	—
San Francisco.....	10	8.20	9.75	10.25	8.45	—	8.15	8.35	8.25	11.55	—	14.45	—	18.00
Seattle.....	.00	8.65	10.40	10.80	8.90	—	8.40	8.40	8.60	—	—	14.65	—	—
St. Louis.....	15	7.57	8.68	9.84	7.65	—	7.89	7.98	7.71	8.44	—	13.49	—	16.50
St. Paul.....	25	7.94	8.59	9.89	7.72	—	7.65	7.94	7.74	8.51	—	13.51	—	16.31

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) \$2.25 delivery. (4) 1000 to 1999 lb. \$2.25 delivery.

*Plus analysis charge. [†]Deduct for country delivery.

To identify producers, see Key on preceding page.

ELECTRICAL SHEETS

F.o.b. Mill Cents Per Lb	22-Gage (Cut Lengths)*	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
			Semi- Processed	Fully Processed
Field.....	8.40	—	8.60	—
Armature.....	9.35	—	9.60	10.10
Elect.	9.95	—	10.20	10.70
Motor.....	10.95	—	11.20	11.70
Dynamic.....	11.65	—	12.10	12.60
Trans. 72.....	12.80	—	13.05	13.55
Trans. 65.....	13.35	—	—	Grain Oriented
Trans. 58.....	13.85	Trans. 80.....	17.45	—
Trans. 52.....	14.85	Trans. 73.....	17.95	—

Producing points: Beach Bottom (W5); Breckinridge (A3); Granite City (G7); Indiana Harbor (I3); Mansfield (EZ); Newport, Ky. (N3); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville (A7)

*Calls 75¢ higher.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails		Single Loop Bale Ties		Galv. Barbed and Twisted Barbless Wire		March. Wire Amt'd		March. Wire Gds.
	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	
Alabama City R3	152	162	173	175	7.40	7.38	—	—	—
Aliquippa, Pa. J3	152	162	175	180	7.40	6.025	—	—	—
Atlanta A3	154	167	173	181	7.50	6.10	—	—	—
Bartonsville K2	154	168	173	174	7.40	7.38	—	—	—
Buffalo W4	—	—	—	—	—	—	—	—	—
Chicago, Ill. N4*	152	166	173	179	7.40	6.90	—	—	—
Cleveland A5	157	—	—	—	—	—	—	—	—
Crawfordsville M4*	154	167	175	178	7.50	6.95	—	—	—
Denora, Pa. A5	152	162	173	175	7.40	7.38	—	—	—
Duluth A1	152	162	173	175	7.40	7.38	—	—	—
Fairfield, Ala. T2	152	163	173	175	7.40	7.38	—	—	—
Galveston D4	157	—	—	—	—	—	—	—	—
Houston S2	157	170	180	185	7.65	6.95	—	—	—
Johnstown, Pa. B3*	152	166	175	178	7.40	7.38	—	—	—
Jointer, Ill. A5	152	162	173	175	7.40	7.38	—	—	—
Kokomo, Ind. C9	154	154	173	177	7.50	7.90	8.35	8.925	—
Los Angeles B2*	157	167	178	180	7.45	8.05	—	—	—
Kansas City S2	157	167	178	180	7.65	8.05	—	—	—
Minneapolis C6	157	167	178	180	7.65	8.05	—	—	—
Menomonie P6	152	162	172	174	7.40	7.38	—	—	—
Moline, Ill. R3	152	162	173	175	7.40	7.38	—	—	—
Pittsburgh, Pa. C7	171	185	195	205	8.35	8.75	—	—	—
Portsmouth P7	152	162	173	175	7.40	7.38	—	—	—
Rankin, Pa. A5	152	162	173	175	7.40	7.38	—	—	—
St. Louis R3	152	162	173	175	8.35	8.75	—	—	—
St. San Francisco C8	152	162	173	175	8.35	8.75	—	—	—
Sparrows Pt. B3*	154	—	175	181	7.50	8.05	—	—	—
Struthers, O. V1	154	—	—	—	7.40	7.38	—	—	—
Worcester A5	158	—	—	—	7.40	7.38	—	—	—
Williamsport, Pa. S3	—	—	160	—	—	—	—	—	—

Galvanized products computed with zinc at 5¢ per lb

Exceptions: *zinc at 12.5¢ per lb; **13¢ zinc.

C-R SPRING STEEL

F.o.b. Mill	CARBON CONTENT				
	0.25	0.41	0.61	0.81	1.00
0.40	0.60	0.80	1.05	1.35	
Bristol, Conn. W12	—	—	10.80	12.95	15.85
Buffalo, N. Y. R7	7.00	8.95	10.50	12.45	15.35
Carnegie, Pa. S9	9.05	10.40	12.75	15.35	—
Cleveland A5	7.10	9.05	10.50	12.75	15.45
Detroit D1	7.28	9.15	10.70	12.85	—
Detroit D2	7.28	9.15	10.80	13.05	15.75
Harrison, N. J. C11	7.15	9.10	10.50	12.45	15.35
Indianapolis C3	7.00	8.95	10.50	12.45	15.35
New Castle, Pa. B4	7.55	9.35	10.90	13.05	—
New Haven, Conn. D1	7.65	9.35	10.90	13.05	15.75
Pawtucket, R. I. N7	7.10	9.05	10.60	12.75	15.45
Pittsburgh S7	7.20	9.05	10.60	12.75	15.45
Riverside, Ill. A1	7.2				

(Effective March 13, 1956)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Unfinished
Bassett U//	4.725	5.65	5.825				
Sa. Chicago RS			7.90				
Easley T//	4.725	5.65		7.90	5.625		
Fairfield T//		5.65		7.90	5.625		
Gary U//	4.725	5.65			5.625		
Ind. Harbor B//	4.725		5.825	7.90	5.625		
Ind. Harbor Y//				7.90			
Johnstown B//		5.65					
Juliet U//		5.65	5.825				
Kansas City S//				7.90			
Lackawanna B//	4.725	5.65	5.825		5.625		
Lakeview B//							12.15
Lebanon B//							12.15
Minneapolis O//	4.725	6.15	5.825	7.90	5.625		12.15
Pittsburgh O//					11.90		12.15
Pittsburgh P//							12.15
Pittsburgh J//							12.15
Seattle B//				7.90			12.65
Steelton B//	4.725		5.825	8.40	5.775		12.65
Struthers Y//				7.90	5.625		
Torrance C//						5.775	
Williamsport S//		5.65					
Youngstown R//				7.90			

COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	\$14.00 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to \$16.50
Foundry, oven coke	
Buffalo, del'd	\$28.75
Chicago, f.o.b.	27.00
Detroit, f.o.b.	27.50
New England, del'd	28.55
Seaboard, N. J., f.o.b.	26.75
Philadelphia, f.o.b.	26.50
Swedeland, Pa., f.o.b.	26.50
Painesville, Ohio, f.o.b.	27.50
Erie, Pa., f.o.b.	27.50
Cleveland, del'd	29.43
Cincinnati, del'd	28.59
St. Paul, f.o.b.	26.50
St. Louis, f.o.b.	28.50
Birmingham, f.o.b.	25.65
Lone Star, Tex., f.o.b.	19.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	23.00	40	106,110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	80	10.10
10	60	24.25	17	72	10.35
7	60	24.50	14	72	10.85
5	60	27.25	12	60	11.75
4	40	30.25	10	60	11.80
3	40	32.00	8	60	12.10
2½	30	33.75			
2	24	52.50			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes		
(Cents per lb, f.o.b. shipping point)		
Copper		
Cast elliptical, 18 in. or longer,		
5000 lb lots		55.92
Electrodeposited		55.25
Brass, 30-20, ball anodes, 2000 lb		
or more		55.00
Zinc, ball anodes, 2000 lb lots		20.75
(for elliptical add 2¢ per lb)		
Nickel, 99 pot plus, rolled carbon		30.50
(rolled depolarized add 3¢ per lb)		
Cadmium		31.70
Tin, ball anodes and elliptical		\$1.00 to \$1.10
Chemicals		
(Cents per lb, f.o.b. shipping point)		
Copper cyanide, 100 lb drum		83.50
Copper sulphate, 5 or more 100 lb		
bags, per cwt		18.15
Nickel salts, single, 4-100 lb bags		33.25
Nickel chloride, freight allowed,		
300 lbs		43.50
Sodium cyanide, domestic, fob N. Y.		
1 to 4 200 lb drums		21.55
(Philadelphia add .50 per lb)		
Zinc cyanide, 100 to 900 lb		55.55
Potassium cyanide, 100 lb drum		
N. Y.		48.00
Chromic acid, flake type, 1 to 10		
100 lb drums		31.20

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolt

	Discounts	Full	Full case	case 20,000 lb.
Quantity or more				
1/4 in. & smaller x 6 in. &				
shorter		61	63	
larger than 1/4 in. diam. and				
all diam. longer than 6 in.		55	57	
Rolled thread carriage bolts				
1/2 in. & smaller x 6 in. and				
shorter		61	63	
Lag, all diam. x 6 in. &				
shorter		61	63	
Lag, all diam. longer than				
6 in.		55	57	
Plow bolts				
		61	63	

Nuts, Hex., H.P., reg. & hvy.

1/4" or smaller	64	66
1/2" to 1 1/4" inclusive	63	65
1 1/4" to 1 1/2" inclusive	65	67
1 1/2" and larger	61	63

Hot Galv. Nuts (all types)

1 1/4" or smaller	44	47
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Finished, Semi-finished, Hex. Nuts

1/4" and smaller	66	66
1/2" and larger	63	63

Rivets

	Base per 100 lb
1/4 in. and larger	\$9.95
7/16 in. and smaller	72

Cap Screws

	Discount	H.C. Heat
Bright Treated		
New std. hex head, packed		
1/4" thru 1/2" diam. x 6"	84	20
and shorter		
9/16" and 5/8" x 6" and	81	16
smaller and shorter		
5/8", 3/4", 1" x 6" and		
shorter		
New std. hex head, bulk*		
1/4" thru 1/2" diam. x 6"	40	41
and shorter		
9/16" and 5/8" diam. x 6"	45	39
and shorter		
5/8", 3/4", 1" x 6" and	31	20
shorter		
*Minimum quantity per item:		
15,000 pieces 1/4", 5/16", 3/8" diam.		
5,000 pieces 7/16", 1/2", 9/16", 5/8" diam.		
2,000 pieces 3/4", 1" diam.		

** Minimum quantity per item:

15,000 pieces 1/4", 5/16", 3/8" diam.

5,000 pieces 7/16", 1/2", 9/16", 5/8" diam.

2,000 pieces 3/4", 1" diam.

Stock, 99.84% pure

Carbonyl iron size 5 to 10

micron, 98%, 98.8+% Fe. \$6.00 to \$1.55

Aluminum freight allowed

Brass, 10 ton lots

... \$7.50 to \$0.00

Copper, electrolytic

minus 325 mesh, 99.8% Fe.

Electrolytic iron, annealed

Fe, carbo lots

imported 99.5+% Fe

domestic 99.5+% Fe

Electrolytic iron, unannealed

minus 325 mesh, 99.8% Fe.

Electrolytic iron, melting

stock, 99.84% pure

Lead

... 7.50¢ plus metal value

Manganese

99%, \$3.00 to \$3.25

Molybdenum

99%, \$1.00

Nickel, annealed

99%, \$1.06

Nickel, spherical, unannealed

#80

... \$1.18

Silicon

99%, \$4.50¢

Solder powder

7.0¢ to 9.0¢ plus met. value

Stainless steel, 302

99.0¢

Stainless steel, 316

1¢.22

Tin

14.0¢ plus metal value

Tungsten, 99% (65 mesh)

44.50¢

Zinc, 10 ton lots

18.75¢ to \$2.50¢

CAST IRON WATER PIPE INDEX

Birmingham 109.8

New York 121.5

Chicago 122.9

San Francisco-L. A. 131.1

Dec. 1955 value, Class B or heavier

6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source:

U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00) \$12.00

No. 1 Ohio 101.25

Sec. quality, Pa., Md., Ky., Ill. 114.00

No. 2 Ohio 98.00

Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50) 18.00

Super Duty

Hays, Pa., Athens, Tex., Windham, Warren, O. 145.00

Curtner, Calif. 163.00

Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 21.00

Silica cement, net ton, bulk, Hays, Pa. 24.00

Silica cement, net ton, bulk, Chicago District, Ensley, Ala. 22.00

Silica cement, net ton, bulk, Utah and Calif. 32.00

Magesite Brick

Standard Baltimore \$114.00

Chemically bonded, Baltimore 102.00

Grain Magnesite

St. 1/4-in. grains

Domestic, f.o.b. Baltimore

in bulk fines removed \$64.00

Domestic, f.o.b. Chewelah, Wash.

Luning, Nev.

in bulk 40.00

in sacks 46.00

Dead Burned Dolomite

Per net ton

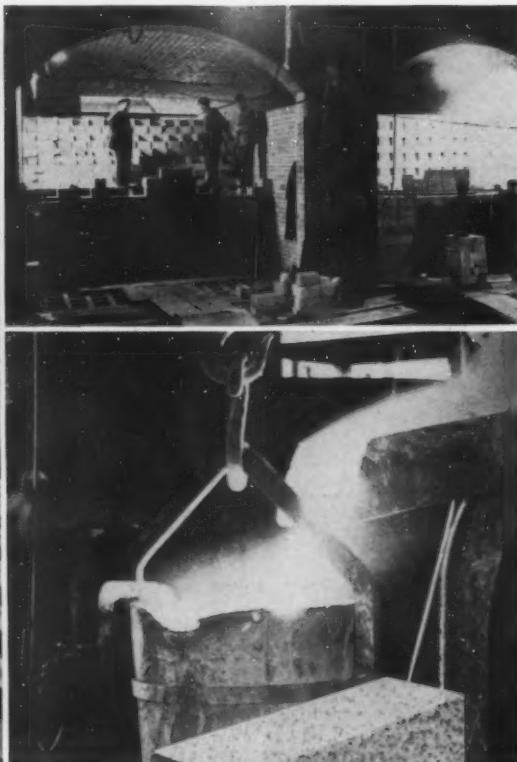
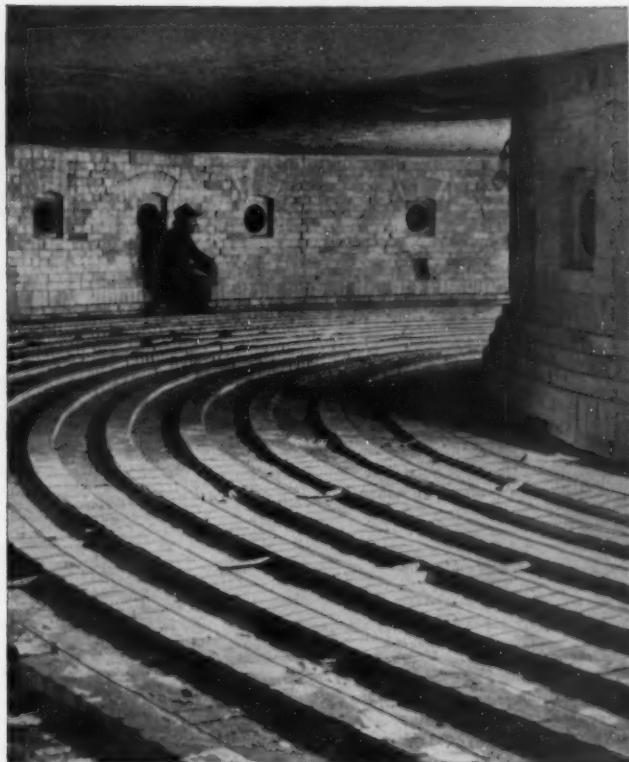
F.o.b. bulk, producing points in:

Pa. W. Va., Ohio \$15.00

Midwest 15.60

Missouri Valley 14.00

Profitable trends in the use of refractories



Laclede-Christy offers simplified way to get exact-purpose fire brick

It's highly profitable, of course, to use refractories exactly suited to each application. There's a simple way to do this. That is to rely upon one source which offers you each refractory type and grade you may need—plus the quality and service you expect.

Laclede-Christy produces 68 different varieties of fire brick and other refractories—to meet a wide temperature range. From this outstanding selection you are certain to obtain the types and grades that serve your needs best.

Laclede offers you refractories custom-typed for your use—not just a product line. Laclede brands such as Spallac, King, Laclede 70, Peerlac, Wallac, Canon City, Marvel and Clearco justify their excellent reputation and acceptance. Laclede checker brick, cupola blocks, tile and many other items also meet Laclede's and your "quality-first" standards.

If you need help to determine your exact-purpose fire brick, Laclede-Christy offers that too. So, for a profitable trend in your use of refractories, get together with Laclede soon. Your representative is nearby.



LACLEDE-CHRISTY COMPANY DIVISION

H. K. PORTER COMPANY, INC.
2000 Hampton Ave. • St. Louis 10, Missouri

Ferroalloy Prices

(Effective March 13, 1956)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk carloads, del'd, 67-71% Cr, 30-1.00% max. Si.	
0.02% C ... 38.50	0.20% C ... 35.50
0.03% C ... 38.00	0.50% C ... 35.25
0.06% C ... 36.50	1.00% C ... 34.00
0.10% C ... 36.00	1.50% C ... 33.85
0.15% C ... 35.75	2.00% C ... 33.75
4.00-4.50% Cr, 67.70% Cr, 1-2% Si ...	26.25
3.50-5.00% Cr, 57-64% Cr, 2.00-4.50% Si ...	35.00
0.025% C (Simplex) ... 31.75	

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.	
0.10% max. C ...	\$1.27
0.50% max. C ...	1.27
9 to 11% C, 88-91% Cr, 0.75% Fe ...	1.36

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (1/4" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.	
Carloads ...	1.25
Ton lots ...	1.27
Less ton lots ...	1.29

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.	
Carloads ...	41.85
Ton lots ...	46.15
Less ton lots ...	48.65

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.	
30-33% Cr, 60-65% Si, 2.00 max. Fe.	
Carloads ...	22.95
Ton lots ...	25.25
Less ton lots ...	26.75

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.	
16-20% Ca, 14-18% Mn, 58-59% Si	
Carloads ...	23.05
Ton lots ...	24.95
Less ton lots ...	26.95

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/4 in. x 12 mesh.	
Ton lots ...	19.65
Less ton lots ...	20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.	
Carload lots ...	17.20
Ton lots ...	18.70
Less ton lots ...	19.95

Graphide No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%; Ti 9 to 11%; Ca 5 to 7%.	
Carload packed ...	18.50
Ton lots to carload packed ...	19.65
Less ton lots ...	20.90

Ferromanganese

Maximum contract base price, f.o.b. lump size, base content 74 to 76 pct Mn.	
Producing Point	Cents per-lb
Marl-tta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	10.25
Johnstown, Pa.	10.25
Sheridan, Pa.	10.25
Philo, Ohio	10.25
S. Duquesne	10.25
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 66 pct Mn:	
Carloads, bulk ...	12.50
Ton lots packed ...	14.70

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmetto, Pa.	
Manganese Silicon	
16 to 19% 3% max.	\$89.50
19 to 21% 3% max.	91.50
21 to 23% 3% max.	94.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, Packed ...	45.75
Ton lots ...	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads ...	30.00
Ton lots ...	32.00
250 to 1999 lb ...	34.00
Premium for hydrogen-removed metal ...	0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ...	
22.35	

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn ...	33.00
0.07% max. C ...	30.95
0.10% max. C ...	30.20
0.15% max. C ...	29.45
0.30% max. C ...	27.95
0.50% max. C ...	27.45
Mn, 5.0-7.0% Si ...	24.45
	27.00
	28.20

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	
Carload bulk ...	11.50
Ton lots ...	12.95
Briquet contract basis carloads, bulk, delivered, per lb of briquet ...	13.15
Ton lots, packed ...	16.35

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or W-natchee, Wash., \$98.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.	
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.	
Ton lots Carloads	
96.50% Si, 2% Fe ...	22.75
98% Si, 1% Fe ...	23.25
	31.95

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.	
Carloads, bulk ...	7.15
Ton lots, packed ...	9.75

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.	
50% Si ...	12.75
65% Si ...	14.50
90% Si ...	18.50
75% Si ...	15.40
85% Si ...	17.10

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast Turnings Distilled	
Ton lots ...	\$2.05
	\$2.95
	\$3.75
Less ton lots ...	2.40
	3.30
	4.55

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.	
Openheart: ...	3.10
Crucible ...	3.20
High speed steel (Primos) ...	3.30

Alifer, 20% Al, 40% Si, 40% Fe,

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.	
Carloads ...	10.65¢
Ton lots ...	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langleloft, Pa., per pound contained Mo	
\$1.84	

Ferror columbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.	
Ton lots ...	\$6.98
Less ton lots ...	6.98

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb can't Cb plus Ta ...	
\$4.65	

Fermomolybdenum, 55-75%, 200-lb containers, f.o.b. Langleloft, Pa., per pound contained Mo	
\$1.54	

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton	
\$90.00	

10 tons to less carload ...	
\$110.00	

Ferrotitanium, 10% regular grade, 0.10% C max., f

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FABRICATOR**

*didn't cost me
a DIME!*



- HOLE PUNCHING
- NOTCHING and
- NIBBLING
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- Built-in gauging, positive alignment mean. MORE profit.

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BULLETIN NO. 26A
Describes the WALES FABRICATOR with pictures and examples of work. Shows the exclusive features that make this equipment such a time saver and profit maker.

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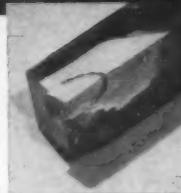
March 15, 1956

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Welding Feature Issue Preview

FOR READERS . . . the April 26th issue of The IRON AGE will offer dollar-saving ideas that show how you can get the most from your welding equipment.

1 Choosing the Right Process. Which are most suitable for welding carbon steels? Austenitic stainless steels? Cast iron? How do the various processes rate for welding aluminum, copper and nickel?

2 What About Economy? When should you automate and to what extent? Or is manual welding your best bet? Pointers on equipment, labor and cleaning costs.

3 Shielding Media. Are you using the right inert gas? Advantages of gas mixtures for certain metals. Can CO₂ or nitrogen cut costs on your jobs?

4 New Techniques. Where and how you can use them effectively. What's to be gained by their application? In time? Costs? Materials? Labor? Quality?

5 Difficult-To-Weld Metals. Which process and to what thicknesses is it usable? Advantages as well as limitations. Pitfalls to avoid. Metallurgical problems and ways of overcoming them.

6 Comparable Electrode Charts. Lists arcwelding electrodes for steel, stainless steel, copper, armor plate, etc. Shows the specifications and the rods to fill them. Also tells who makes them.

7 Availability of Other Rods. What rods to use for processes other than metal arcwelding. For aluminum, magnesium, stainless steel, copper, nickel and construction steels? Brazing rods are included.

FOR ADVERTISERS . . . it offers an opportunity to tie in with the third major editorial effort in The IRON AGE "How To Get More For Your Metalworking Dollar" series . . . a series which is getting unprecedented attention among executives throughout metalworking.

DEADLINE APRIL 13, 1956

The **IRON AGE** Chestnut & 56th Streets, Philadelphia 39, Penna. SH 8-2000

THE TREND TO CECO-DROPS...

JAMESTOWN, N.Y.

SITUATION: Growing sales were taxing production capacity of tool mfr's. forge shop. Had four belt-driven board drop hammers.

SOLUTION: Four Ceco-Drops now in operation—have been giving excellent service. Production is up—maintenance is down. "3 hours charged against Ceco-Drops in 42 days"—"One Ceco-Drop ran 108 hrs. (21 days) without maintenance or die work."

ALLENTHON, PA.

SITUATION: Tool works had the problem of keeping 23 "old dog" board drop hammers operating profitably. Had but one recent model "J" Chambersburg Board Drop.

SOLUTION: Management launched a modernization program calling for nine Ceco-Drops capable of producing a yearly tonnage in excess of the 23 old board drop hammers. Four of the Ceco-Drops are now in operation. Shop layout has been revised. Efficiency and production methods have been improved.

SKOKIE, ILL.

SITUATION: One of largest manufacturers of hand tools is planning a new shop. Decided to have modern Gravity Drop Hammers.

SOLUTION: Selected Ceco-Drops, and on a programmed basis is replacing board drop hammers with Ceco-Drops. To date, two 2,000 lb. Ceco-Drops and one 2,500 lb. Ceco-Drop are in operation—"Doing fine". Another 2,500 lb. Ceco-Drop on order.

LANSING, MICH.

Lansing, Mich. is unique among industrial cities in the concentration of drop forging activity in its many factories. It may well claim the title of "Drop Forging Capital of the World". In Lansing are six great forging shops covering 14 acres of land, with a working area of 985,579 sq. ft. All these great forging shops are using Chambersburg Ceco-Drops.

Forge Shop No. 1—installed the first Ceco-Drop in 1947—now forging connecting rods.

Forge Shop No. 2—has installed 6 Ceco-Drops since 1950—making automotive forgings.

Forge Shop No. 3—bought 4 Ceco-Drops since 1948—Commercial and automotive forgings.

Forge Shop No. 4—bought seven Ceco-Drops in the last six years.

Forge Shop No. 5—Purchased 3 Ceco-Drops in 2 years.

Forge Shop No. 6—One of largest in world. Installed 11 Ceco-Drops since 1951.

FLINT, MICH.

SITUATION: Large Auto Co. with 16 Board Drop Hammers—(7 of them Chambersburg "J's")—ranging in age from 7 to 30 years. Lowered production rates and mounting maintenance costs.

SOLUTION: Started modernization in 1953. Converted* four "J's" with Ceco-Drop upper works. Cost and down time reduced—production up—operators like them. Other "J's" to be converted*. Ceco-Drops will replace older board hammers.

*Saves cost of anvil and foundation!

COLUMBUS, O.

SITUATION: Job shop with 5 Board Drop Hammers finds equipment obsolete—and higher production of other more modern shops.

SOLUTION: Initiated 10 year program of modernization to include 15 Ceco-Drops. Three Ceco-Drops already installed to replace board drop hammers.

The gravity drop hammer with short stroke control

... and remember
the Lansing Story ?

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THE CLEARING HOUSE

FREE TECHNICAL LITERATURE

Pittsburgh Shows Strength . . .

Business continues to roll in to used and rebuilt machinery dealers at as good a pace—or in most cases—better than last year.

While last year wound up as one of the best on record, early showings in the first few months of this year are nothing to sneeze at. Some dealers feel already that '56 business could top that of last year.

Spotlight On Steel Mills . . .

Since somewhere near 75 pct of the Pittsburgh volume comes from the steel mills, there is every indication that the current exceptionally high buying rate will continue at present levels through most of the upcoming 9-month period.

Electric rebuilders are doing unusually good business with the high volume showing little letup since the first of the year.

One major rebuilder reports, "Business has never been better. The first two months volume this year was better than double the same period last year which in itself was better than average."

Demand Outstrips Supply . . .
The big bugaboo which continues to limit the otherwise strong sales picture in this market to date is that demand is still outstripping supply.

Inquiries, say dealers, continue far greater than the supply of available equipment. And, certain inquiries are virtually impossible to fill. Steel mill equipment dealers point out that certain size bar mills simply aren't available.

These fall mostly in the category between 10 and 20 inches. Large span DC cranes are also almost unobtainable.

New Equipment Slow In Coming . . . Another factor keeping the demand at a high level are the large backlog and long delivery times for new equipment.

As an example, machine tool orders rose to a record peacetime figure during December of last year. Although orders were off somewhat in January, January shipments were also the lowest in four months and the unfilled order backlog climbed to eight and a half months. This is the biggest backlog since March, 1953.

Export Is Strong Factor . . . Export sales in all lines continues to be a strong factor in the market.

There is also a noticeable pickup in inquiries and sales from the non-ferrous industries.

Strike Figures Prominently . . . The Westinghouse strike is also affecting the used and rebuilt machinery market in this area to a marked degree.

The lack of motors, for instance, has held up delivery and installation of some mill equipment, dealers report.

Mills, in turn, are calling on dealers to fill in the gap, if they can. This is particularly true in the case of electric motors.

Some new equipment has been installed with rebuilt motors as substitutes for new motors which normally would be installed.

There is also a shortage of new motor parts, such as armatures and fields.

So, instead of replacing parts, the mills now are buying rebuilt motors to do the job until new parts are again available.

How About New York? . . . The current wave of good buying and selling levels is also being reflected in the New York market these days.

Some dealers point out that January and February sales ran 50 pct better this year than during the same period a year ago. Demand is industrywide with customers showing special interest in late-model OBI's.

THE CLEARING HOUSE

CONSIDER GOOD USED EQUIPMENT FIRST

BALERS

Logemann Baler, Charging Box 60"x18"x16", Produces Bales approx. 100 lbs.

Logemann Baler, Charging Box 72x12x18", Produces Bales 200 lbs.

BENDING ROLLS

8" x 3/4" Hilles & Jones Pyramid Type

10" x 3/4" Berthach Initial Type Bending Roll

20" x 3/4" Berthach Pyramid Type

24" x 3/4" Hilles & Jones Pyramid Type

BRACKETS

12" x 1 1/2" Drela & Krump

12" x 1 1/2" Drela & Krump, Motor Driven

BRAKE—PRESS TYPE

10" x 3/4" Cincinnati

14" x 3/4" Cincinnati Series 120-14

BROACH

Model VP-4-10-40-American Vertical Hydr. Broach

Max. Capacity 60 ton, Stroke 40", Motor Drive

BULLDOZER

#27 Williams & White, 22" Stroke, 10" x 50" Face of Crossover

CRANES—OVERHEAD ELECTRIC TRAVELING

1 ton P&H 20' Span 230 Volt D.C.

2 ton Whiting 48' Span 230/3/60 A.C.

3 ton P&H 80' Span 230/3/60 A.C.

3 ton Cleveland 96' Span 230 Volt D.C.

7 1/2 ton P&H 65' Span 440/3/60 A.C.

7 1/2 ton Bedford 78' Span 440/3/60 A.C.

18 ton Milwaukee 80' Span 230 Volt D.C.

10 ton P&H 96' Span 230 Volt D.C.

20 ton Toledo 75' Span 550/3/60 A.C.

120 ton Whiting 80' Span 230/3/60 A.C.

FORGING MACHINE

1" to 5" Acme, Ajax National

FURNACES

30" x 36" L&N Homo Carb PH Type Furnace, Electric Fired 100 KW 220/440/3/60

Hevi-Duty Electric Furnace, Hot Zone 18" high, 26"

Wide Opening, 10" Deep I.D.

Sunbeam-Stewart Gas Fired Furnace 12" x 36" x 36"

15 ton High-Temp Top Charge

GRINDER—ROLL

20" x 96' Lands, With Crowning Attachment

HAMMERS—BOARD DROP—STEAM DROP STEAM FORGING—800 lb. to 20,000 lb.

HARDWARE—MISC.

230 ton Nasco, Capacity 4" Square

2000 lb Chamberlain Coco-Drop

LEVELLERS—ROLLER

18" United, 12 Rolls 1 1/2" Dia.

52" McKay, 17 Rolls 3/4" Dia.

90" Budd-McKay Sheet Processor & Leveler, Leveling Rolls 3" dia.

96" Aluma-Standard, 19 Rolls 2 1/2" Dia.

PLAQUE—METAL EDGE

30" x 1 1/2" So Union, 16 Plaques 1/2" thick

35" x 1 1/2" Southwark, 16 Plaques 1/2" thick

PRESSES—HYDRAULIC

550 ton Baldwin Southwark 12" Stroke 48" x 25" Between Columns

800 ton Clearing 48" Stroke, Bed Area 18" x 48"

1000 ton Gandy Double Acting 45" Stroke, Bed Area 72" x 145"

1257 ton Baldwin Southwark Forging Press, 30" Stroke Main Ram, 54" x 41" Bed, Columns 2045 ton Birdsboro 4 Columns, 14" Stroke Piston 42" x 46" Drills 47" Bed

4500 ton B-H Hydr. Forging Press

PRESSES—STRAIGHT SIDE

28 1/2" x 20" Zeu & Haenmann Percussion Press 75 ton

Clearing Model TFL1500-200 Triple Acting, Strokes

40, 32, 14", Bed Area 100" x 200"

Verson 81-40 Mech. Eccentric Type Single Point Suspension Press, 200 ton, 30" Stroke

2667 ton Toledo 100 ton Knuckle Joint Press

PUNCH & SHEAR COMBINATIONS

2 1/2" Buc-alo Universal Ironworker

Style EF Cleveland 60" Throat, Punch 1 1/4" thru 1"

Style EF Cleveland 20" Throat, Punch 1 1/4" thru 1"

Style W Cleveland 10" Throat, 312 Ton

ROLLS—PLATE STRAIGHTENING

60" McKay Universal, 7 Rolls 19" Dia.

72" Berthach Seven 7" Dia. Rolls

ROLLING MILLS

12" x 16" Phila. Single Stand, Two High

15" x 28" Farrel Single Stand, Two High

15" x 28" Buc-alo Single Stand, Two High

16" x 31" Farrel Single Stand, Two High

22" x 12" x 40" Lewis 2-High Sheet Mill

12" Three High Bar Mill

ROLLS—FORMING

8 Stand Rafter Tube Forming Machine, Spindle 1 1/2"

3 Stand Buc-alo Roll Forming Machine, Shaft 2 1/2"

SCREWDRADE—PUNCH

60" x 1" Pels

80" x 3/4" Pels

86" x 1" Hilles & Jones

SCREW—ANGLE

10" x 1" Hilles & Jones

SCREW—BAR

21 H & Guillotine, Capacity 3 1/2" Square, 4" Round

12" x 2 1/16" Cincinnati #1412

12" x 3/4" Lay & Nawrath

SLITTER

4" Under Sheet & Strip Slitting Line

4" 49" Yoder Gang Slitter, 5" Threaded Arbor

5" 30" Yoder Slitter, 7" Plain Arbor

STRAIGHTENERS

Aetna-Standard 12 Roll Straightener, Capacity 2 1/2"

O.D. Tubing

No. 1 Shuster Straightener & Cut-Off, Capacity 1/4"

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EQUIPMENT**

D. C. MOTORS

Qu.	H.P.	Make	Type	Volts	R.P.M.
1	300	Whse.	Tandem	550	600
1	2200	G.E.	MCF	600	500/500
2	1200	Whse.	MCF	600	500/500
1	1200	J.W. Whse.	MCF	600	500/500
1	940	Whse.	QM	350	140/170
1	800	Whse.	QM	350	450/550
1	600	Al. Ch.	QM	350	400/800
1	500	Whse.	CC-216	600	300/900
1	450	Whse.	MCF	550	250/500
1	200	G.E.	MPC	230	400/600
1	150	G.E.	CD-1650Z	230	500/1500
1	200	Whse.	CB-5113	230	400/800
1	150	Cr. Wh.	65H	600	230/150
1	150	Cr. Wh.	82H-TEFC	230	200/150
1	150	Cr. Wh.	82H-TEFC	230	200/150
1	150	Whse.	SK-151B	230	900/1300
1	150	Whse.	SK-201	230	360/950
1	120	G.E.	MCF	230	250/1000
1	125	Rel.	10"GT	230	400/1200
1	100	Whse.	RR-181	230	450/1000
1	75	C.W.	53H-TEFC	230	800
1	50	G.E.	MD-412AE	230	500

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	R.P.M.	D.C.	A.C.	Volts
1	3000 (3U) Whse.	720	600	2400/6000	12000	2400/4800
2	2000/2400	G.E.	450	250/300	2300/4600	
1	1750/2100	G.E.	514	250/300	2300/4600	
1	2000	G.E.	500	250/300	2300/4600	
1	2070	G.E.	514	600	2300/4600	
1	1500	G.E.	730	600	6600/13200	
1	1250	Whse.	730	600	2300/4600	
1	750	Whse.	900	500	2300/4600	
1	500	Whse.	940	125/250	1440	
1	200	Whse.	1700	250	2400/4800	

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Volts
1	2500	A.C.	OA	3	6000/11000/2400/4160Y
3	1600	G.E.	HVDJ	1	2400/4800
6	1000	Waggon	OIBC	1	13200/4600
3	667	G.E.	HD	1	13800/2300
3	333	G.E.	HS	1	7200/2400/4160Y
3	333	G.E.	HS	1	13200/2300
3	333	G.E.	HS	1	2300/4000/2300/4500
3	333	G.E.	HSWR	1	2300/4000/2300/4500
3	333	G.E.	D1SC	1	34500/120/240

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I-12" Swing x 90" Between Centers Niles Element Peabody Heavy Duty Engine Lathe—60" over carriage, 2 carri, each with 15 h.p. motor. Drive motor 50 h.p. bed in four sections.

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Write for the **Curry List** of available steel plant equipment

1—24" Bar Mill — 3-stands 3-Hi, complete with Tables, Bloom Shear, Saw, Furnace and DC Drive.

1—80" Hot Strip Mill Stands. 3-Stands 4-Hi with Pinion Stands.

1—15" Hot Strip Mill. 8-Stands Continuous, 4-Stands Cross-Country. Complete with Furnaces, Drives, Hot Bed and Shears.

1—8" dia. x 8" body 2-Hi Cold Reduction Mill, complete with 50 H.P. DC Motor, Combination Pinion Stand and Drive.

1—1½" x 96" Down Cut Plate Shearing Line, complete with two Shears, Roller Tables, Gauges, Piler, etc.

1—¾" x 12' Morgan Plate Shear. 18" Cap. Complete with Holdown and 50 H.P. AC Motor.

1—26" Sheet Bar Shear. Complete with 30 H.P. Motor and driven Entry and Delivery Tables.

1—3/16" x 12' Stamco Power Squaring Shear. Complete with Holdown.

1—20,000# Farrel-Birmingham Drawbench. Single Chain. Single Draw. 50 Ft. Length of Draw. Complete with 15 H.P. DC Motor.

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130 CFM 100 PSI 7 x 7 Ing. EB-1
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175 CFM 180 PSI 9 x 9 Ing. ES-CPT-Amer.
210 CFM 150 PSI 10 x 10 Ing. ES-3
234 CFM 100 PSI 9 x 9 Ing. ES-CPT-T
252 CFM 3500 PSI Werth. (4) stage HBA
296 CFM 500 PSI 10-½" x 10 Ing. XOB
323 CFM 35 PSI 10 x 7 Ing. ES (10) available
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470 CFM 125 PSI 15-½" x 10 Ing. XOB
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2200 CFM 100 PSI 26-15 x 18 Chicago OCE 3-60-440

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Heller Universal Cold Saw complete with motor, control, table. Includes Heller Saw Sharpener and a lot of 26" & 28" saws. Machine capacity up to 8½" round stock. In excellent condition. Priced to move from storage quickly. For price and details.

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24"x276" LANDIS Type "B" Hydraulic Plain Cylindrical Grinder.

2H, 2K & 3H K & T Plain & Vertical Millers.

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FOR SALE

100 K W Ajax, high frequency induction furnace, 4 yrs. old, in excellent condition and available next May. Can be seen in operation. Reason for selling installing larger unit.

MIDWEST ALLOYS, INC.
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I—Tabor Abrasive Cutoff Machine with 10 horsepower motor. Has had very little use. Looks and runs like new.

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72" Hanchett 3-spd. rotary surface, new 1948.
16" x 96" Landis gap type cylindrical, new 1941.
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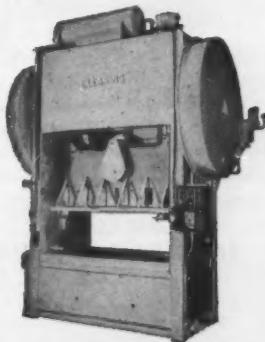
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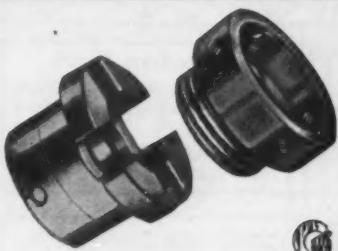
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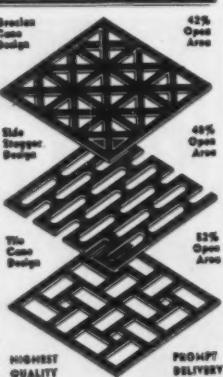
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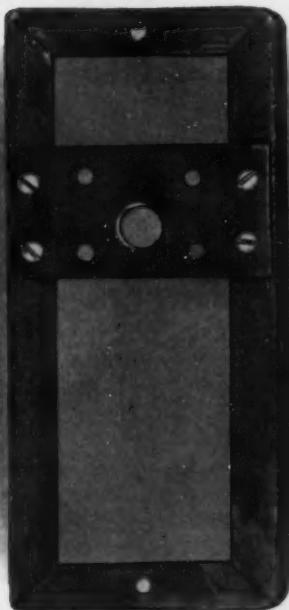
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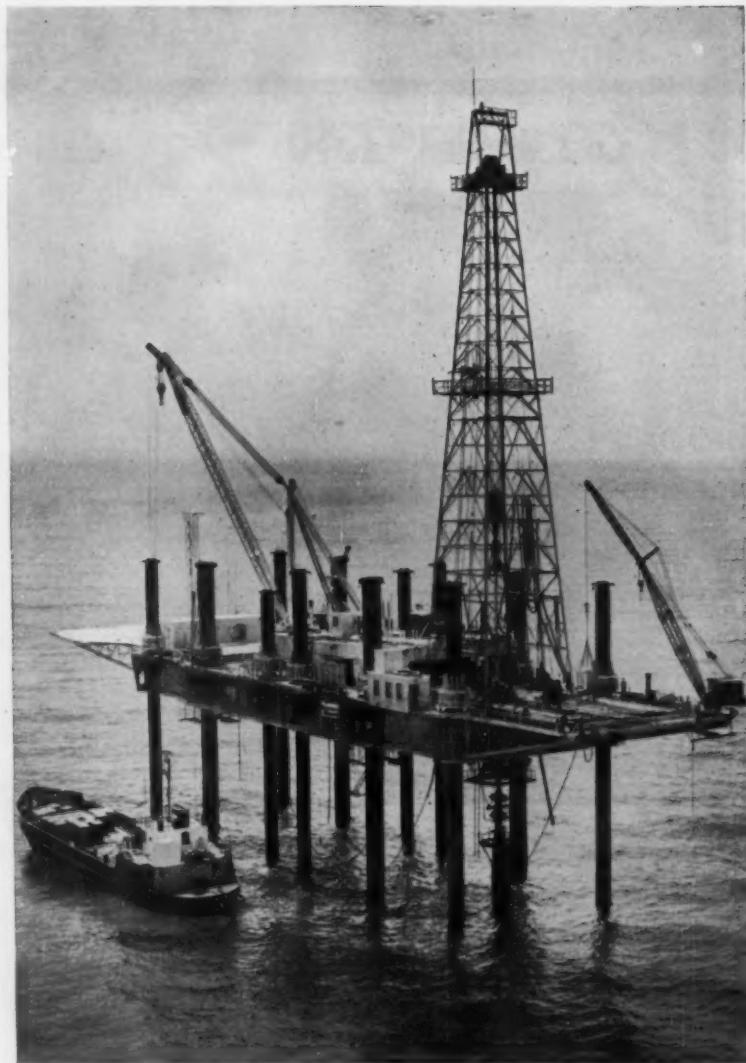
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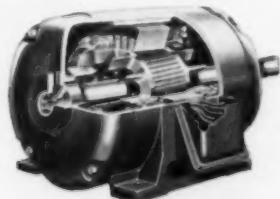
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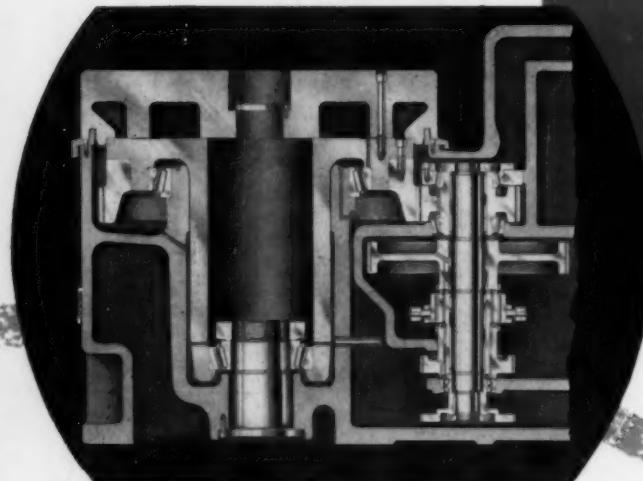


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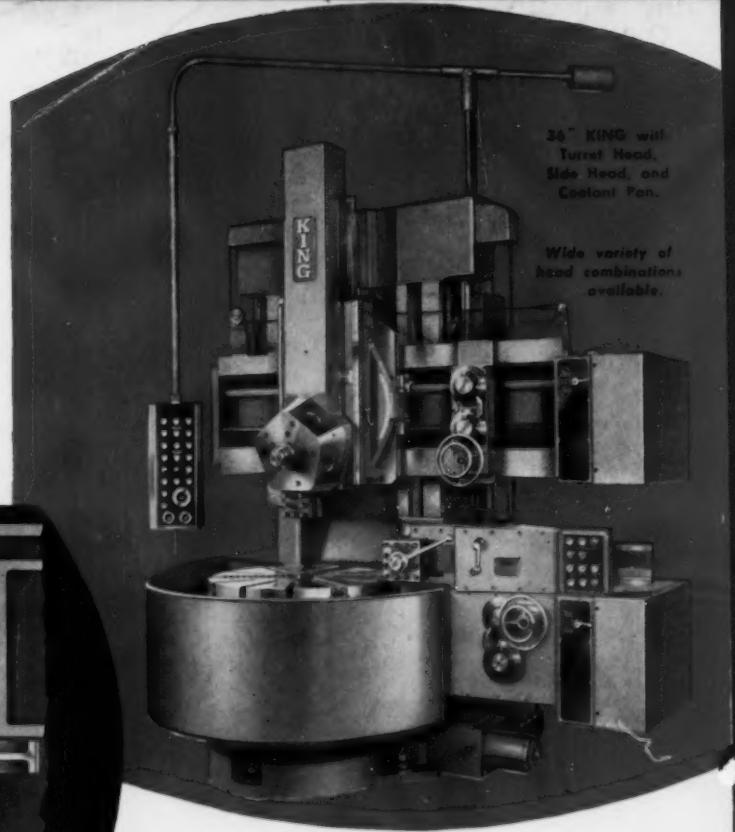
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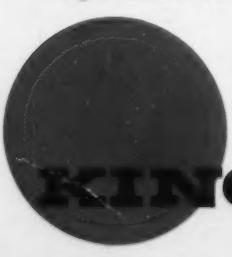
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